Public Stewardship of Private for-Profit Health Care in Low- and Middle-income Countries: A Systematic Review.

Leila Hussein Abdullahi
HSSLEY001

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Supervisor: Charles Shey Wiysonge, MPhil, MD
Chief Research Officer, Vaccines for Africa Initiative (VACFA)
Division of Medical Microbiology, Department of Clinical Laboratory Sciences
University of Cape Town

DECLARATION

I, Leila H. Abdullahi, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Date: 25/05/2012.....

Table of content:

PART A: PROTOCOL

A1. Background

Governments have the responsibility to provide basic services, including health care, to their citizens. However, the public sector is not sufficiently well-equipped and financed to provide high quality health services that are accessible to all.[1] This explains why private healthcare providers play a major role in health service provision in many low and middle-income countries.[2-6] The private health sector is not homogeneous, but consists of for-profit and not-for-profit providers as well as formal and informal providers of health care. The private for-profit sector refers to the part of the economy that is run by individuals and companies for profit and is not state-controlled. On the other hand, private not-for-profit providers refer to organisations that use surplus revenues to achieve their goals, rather than distributing them as profit or dividends.

There is growing concern that health care provided in the private sector is not always of high technical quality.[2, 3, 6] Given the need to work with the private sector to increase access to services, various strategies have been proposed that governments can employ to engage the private sector in service provision.[6] These include regulation, contracting, financing and social marketing, training, and coordination.[1, 6] These interventions are generally applied in combination to reach two important goals: (1) improving the quality of care delivered by existing service providers; and (2) expanding the coverage of private sector services and rationalising this coverage with that of public sector providers.[6] However, there is a paucity of systematic reviews on the effects of these interventions on the quality and accessibility of private for-profit health care in low and middle-income countries.[1, 2, 6] We therefore initiated this review to assess the public stewardship of the private for-profit health sector in low and middle-income countries.

A1.1. Description of the condition

Scarce government resources in low and middle-income countries have led to a decline in the quantity and quality of public health services.[2, 4, 6, 7] These public health failures have led to a drastic increase in private providers of health services, both for-profit and not-for profit, in many low and middle-income countries.[1-9] The consequence of this expansion in the private health sector is that (poor) communities spend outsized amounts of money for private health services; at times when cheaper public sector alternatives are available.[3, 4, 6] However, the suitability and quality of the services provided by the private health sector is increasingly being questioned.[2, 6]

A1.2. Description of the intervention

The growing concern regarding the technical failures of health care provided by the private for-profit sector has led to the development of interventions aimed at addressing these limitations, which simultaneously take advantage of the potential for involving the private for-profit sector to achieve public health goals.[9] This review will assess the public stewardship of private for-profit healthcare providers in low and middle-income countries. Public stewardship refers to government policies, regulatory mechanisms and implementation strategies for ensuring guidance and accountability.[10] Various strategies have been proposed for improving the functioning of the private for-profit health sector in order to increase the quality, availability, and affordability of health care for poor people in low and middle income countries. [1, 4, 6, 7] These strategies include regulation, contracting, social marketing, franchising, use of vouchers, training, pay for performance, and coordination. We will focus on three types of strategic interventions, namely, regulation, training, and coordination. Regulation refers to the setting and enforcing of standards for the private sector; training involves educating and supporting private service providers; and coordination entails organising and creating alliances among private and public sector healthcare providers. We

will exclude potential interventions which are already covered by systematic reviews published in the last three years; such as social marketing and franchising, [11] contracting, [12] and pay for performance.[13]

A1.3. How the intervention might work

Regulatory interventions take the form of rules, enforcement systems and sanction mechanisms, and can be applied at the levels of the healthcare provider, organisation, or facility. At the provider level, regulation may include requirements for pre-service training, continuing education, licensing, and certification of providers. At the organisational or facility level, regulation may aim to control the location of facilities, their registration, prices and minimum complement of staff or facilities. Pharmaceutical market regulation aims to limit the availability of harmful drugs and unregistered products, minimise drug misuse, control the sale of specific drugs through prescriptions, and control drug manufacture and importation.[9] Training interventions may involve formal training sessions (educational meetings, workshops), vendor-to-vendor education, distribution of guidelines, printed educational materials, educational outreach i.e. a personal visit by a trained government official to private healthcare providers in their own settings, and audit and feedback i.e. a summary of the performance of private for-profit providers over a specified period of time given in a verbal or written format; [4, 6, 14-16] alone or in combination. A wide variety of private sector components could be targeted for training, including physicians, pharmacists, midwives, nurses, and traditional healers. Finally, government coordination of private for-profit health care would ensure harmonised minimum standards for health service delivery across geographic areas and social groups.[6] The ultimate aim of government regulatory, training, and coordination interventions is to promote better health outcomes and financial protection; and higher quality and more equitable private for-profit health care delivery.[7]

A1.4. Why it is important to do this review

A systematic review published in 2007 found "evidence that effective public-private partnerships can increase access, improve equity, and raise quality of health services".[4] However, using the GRADE approach,[17, 18] this evidence on the effectiveness of interventions for working with the private for-profit sector to improve the utilisation and quality of health services for the poor in low and middle- income countries was found to be of low quality.[9] The implication of the low quality of the evidence is that further research on this topic is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. It is possible that additional primary studies may have been conducted on this topic. Therefore there is a great need for current best evidence on interventions for working with private for-profit healthcare providers to improve access and quality of health services. We plan to review the currently available evidence on public sector efforts to work with private for-profit health service providers to improve existing health services and expand and rationalise the coverage of these services.[6]

A2. Objectives

To assess the effects of public sector regulation, training, or coordination of health services provided by the private for-profit sector in low and middle-income countries.

A3. Methods

A3.1. Criteria for considering studies for this review

A3.1.1.Types of studies

We will consider the following study designs: randomised controlled trials (RCTs) and non-randomised control trials which include controlled clinical trials (CCTs), interrupted time series designs (ITS) and controlled before and after studies (CBAs).

We will include both individually-randomised and cluster-randomised controlled trials. We will include an ITS study only if outcomes are measured during at least three points before and three points after the intervention, and will exclude simple pre-post designs. To be included in the review, a CBA study must include at least two intervention groups and at least two comparable control groups, with simultaneous data collection.

A3.1.2. Types of participants

Studies taking place in low and middle income countries as defined by the World Bank. All types of health services provided the private for-profit sector will be included in our review.

A3.1.3. Types of interventions

Regulation, training, or coordination of any intensity or duration; implemented by the public sector. The control must be a no-intervention or alternate-intervention group.

Regulation refers to the setting and enforcing of standards for the private sector; training involves educating and supporting private service providers; and coordination entails organising and creating alliances among private and public healthcare providers.

A3.1.4. Types of outcome measures

A3.1.4.1. Primary outcomes

- Quality of care (measured as adherence to recommended practice or guidelines).

A3.1.4.2. Secondary outcomes

- Mortality or morbidity.
- Resource use.
- Adverse effects (e.g. undesirable impacts on existing public or private services, inappropriate use of services, distortions in the provision of services).
- Satisfaction of both health provider and patient.
- Attitudes of both health provider and patient.

A3.2. Search methods for identification of studies

A comprehensive search will be performed to identify both published and unpublished articles with no language restriction. The search strategies for electronic databases will incorporate validated search strategy for RCTs, non-RCTs, CBAs, and ITS studies combined with relevant MeSH and free-text terms relating to health regulation, training and coordination literature for low and middle-income countries. The detailed search strategy is provided in section A appendix 6.1.

A3.2.1. Electronic searches

We will search the following electronic databases for primary studies:

- Cochrane Central Register of Controlled Trials (CENTRAL)
- MEDLINE
- EMBASE
- Science Citation Index and Social Sciences Citation Index

A3.2.2. Searching other resources

We will search for related reviews in the Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effectiveness (DARE), and PubMed. Reference lists of relevant reviews identified and full-text articles reviewed for inclusion in the review will be checked for additional information. We will also search the World Health Organization (WHO) Library Information System (WHOLIS) and the WHO Clinical Trials Registry Platform.

A3.3. Data collection and analysis

A3.3.1. Selection of studies

We will use the inclusion criteria described above to develop a screening guide, which we will pilot to ensure that the criteria are clear to, and can be consistently applied by all review authors. We (LA, CW) will independently screen the titles and abstracts of studies identified from the searches using the screening guide. We will retrieve all records deemed potentially

eligible by at least one of the two authors, and discard the rest. LA will obtain the full text of all potentially eligible articles, and LA and CW will independently examine each of these for eligibility. Each of the two review authors will compile a list of studies which he or she believes meet the inclusion criteria. Both authors will then compare their list of included and excluded studies, resolving any discrepancies by discussion and consensus.

A3.3.2. Data extraction and management

Two authors (LA, CW) will independently extract descriptive and outcome data for each paper using a pre-designed data collection checklist. Detailed data extraction form is provided in section A appendix 6.2 . Both authors will compare their list of included and excluded studies, resolving any discrepancies by discussion and consensus. One review author (LA) will compile these data and enter the final outcome data into Review Manager (RevMan) 5.1 for meta-analysis. A second review author (CW) will perform double checks in RevMan to ensure that there are no errors in the data entered.

A3.3.3. Assessment of risk of bias in included studies

We will assess the risk of bias based on six standard domains (as appropriate) [19] :

- Sequence generation
- Concealment of allocation
- Blinded or objective assessment of primary outcome(s)
- Incomplete outcome data
- Selective outcome reporting
- Other source of bias.

For each included study, we will report our assessment of risk of bias i.e. low, high or unclear risk for each domain together with a descriptive summary of the information that influenced our judgment.

A3.3.4. Measures of treatment effect

We will group measures of treatment effect based on outcome variables. For dichotomous outcomes, results from each trial will be expressed as a risk ratio (RR) with 95% confidence intervals. We will transform ordinal outcomes into binary data when possible. Continuous outcomes may be presented in several ways. When absolute values of post-intervention means and standard deviations (SD) are given, using the same rating across studies, we will use these to calculate the mean difference (MD) and 95% confidence intervals. If different scales are used to measure the same outcomes, we will calculate the standardised mean difference (SMD) with 95% confidence intervals (CI). We will analyse ITS studies using either a regression analysis with time trends before and after the intervention, which adjusts for autocorrelation and any periodic changes; or any other technique that adjusts for autocorrelation and secular trends. We will present results for the outcomes as changes along two dimensions: change in level and change in slope. Change in level is the immediate effect of the policy and change in slope is the change in the trend from pre- to post-intervention. It reflects the long-term effect of the intervention.

A3.3.5. Unit of analysis issues

If investigators report cluster-randomised trial data as if the randomisation was performed on the individuals rather than the clusters, we will request the intra-cluster correlation coefficient (ICC) from the study authors; failing which we will obtain external estimates of the ICC from similar studies or available resources.[20] Once established, we will use the ICC to re-analyse the trial data to obtain approximate correct analyses.[21] We plan to combine the effect estimates and their corrected standard errors from cluster-randomised trials with those from parallel group designs using the generic inverse variance method.[19] If insufficient information is available to control for clustering in this way, we will enter data into RevMan using individuals as the unit of analysis. We will then perform sensitivity analyses to assess the potential bias that may have occurred as a result of the inadequately controlled clustered

trials. We will also perform sensitivity analyses if the ICCs were obtained from external sources to assess the potential biasing effects of inadequately controlled cluster-randomised trials.[21]

A3.3.6. Dealing with missing data

Where necessary, we will contact the corresponding authors of included studies to supply any unreported data. If the corresponding author does not respond within one week of our request, we will contact other authors (copying in the corresponding author). If a study reports outcomes only for participants completing the trial or only for participants who followed the protocol, we will contact the authors and ask them to provide additional information to permit us to conduct meta-analyses by intention-to-treat. We will describe missing data and dropouts for each included study in the Risk of Bias table, and discuss the extent to which the missing data could alter our results. We will conduct sensitivity analyses to assess the effect of missing data on our primary meta-analyses.

A3.3.7. Assessment of heterogeneity

If we find studies of similar interventions that report similar outcomes, we will examine statistical heterogeneity between study results using the Chi^2 test of homogeneity (with significance defined at the 10% alpha-level), and quantify any statistical heterogeneity between study results using the I^2 statistic.[19]

A3.3.8. Data synthesis

If we identify two or more studies with similar interventions and comparison groups that report similar outcome measures, we will use meta-analysis to estimate the overall effect across those studies. We will pool the data using random-effects method because we anticipate significant heterogeneity. We will calculate all overall effects, if applicable, using inverse variance methods.

A3.3.9 Subgroup analysis and investigation of heterogeneity

We do not plan any subgroup analyses since we anticipate that studies might not be similar enough to directly compare the estimates of effect. We will stratify analysis by type of intervention (i.e. regulation, training, and coordination) and study design.

A3.3.9. Sensitivity analysis

If we find studies that are similar enough that it would be sensible to combine them in a meta-analysis, we will conduct sensitivity analyses to investigate the robustness of the results to risk of bias (i.e. omitting any studies with high risk of bias) and method of meta-analysis (i.e., random-effects versus fixed-effect).

A3.3.10. Grading the quality of evidence

We will use the GRADE approach to assess the quality of evidence related to the primary outcome.[18] The GRADE approach results in an assessment of the quality of a body of evidence as high, moderate, low, or very low.[18] High quality evidence implies that "further research is very unlikely to change our confidence in the estimate of effect". Moderate quality evidence means that "further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate". Evidence is considered of low quality if "further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate", and very low quality if "we have very little confidence in the effect estimate".[17] There are a number of factors that affect the quality of evidence. These include but not limited to: study limitations, inconsistency of results, indirectness of evidence, imprecision, and reporting bias. [18]

A4. Ethics

Systematic reviews draw on publicly available data, and therefore do not require formal ethical review.

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A6. Appendices

A6.1. Search strategy

CENTRAL (Cochrane Library)

#	Searches
#1	MeSH descriptor Public-Private Sector Partnerships, this term only
#2	MeSH descriptor Private Sector, this term only
#3	MeSH descriptor Private Practice, this term only
#4	MeSH descriptor Hospitals, Private, this term only
#5	MeSH descriptor Privatization, this term only
#6	privat*:ti,ab
#7	MeSH descriptor Public Sector, this term only
#8	MeSH descriptor Public Policy, this term only
#9	MeSH descriptor Health Policy, this term only
#10	MeSH descriptor State Dentistry, this term only
#11	MeSH descriptor Health Care Reform, this term only
#12	MeSH descriptor Health Planning, this term only
#13	MeSH descriptor Social Control, Formal, this term only
#14	MeSH descriptor Law Enforcement, this term only
#15	MeSH descriptor Government explode all trees
#16	MeSH descriptor Government Regulation, this term only
#17	MeSH descriptor Facility Regulation and Control, this term only
#18	MeSH descriptor Policy Making, this term only
#19	MeSH descriptor Jurisprudence, this term only
#20	MeSH descriptor Mandatory Reporting, this term only
#21	MeSH descriptor Politics, this term only
#22	MeSH descriptor Legislation as Topic, this term only
#23	MeSH descriptor Legislation, Hospital, this term only
#24	MeSH descriptor Legislation, Medical, this term only
#25	MeSH descriptor Legislation, Nursing, this term only
#26	MeSH descriptor Legislation, Pharmacy, this term only
#27	MeSH descriptor Legislation, Drug, this term only
#28	MeSH descriptor Legislation, Dental, this term only
#29	(public* or stewardship* or governance or governing or coordinat* or co NEXT ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*):ti,ab
#30	MeSH descriptor Physician's Practice Patterns, this term only
#31	MeSH descriptor Nurse's Practice Patterns, this term only
#32	MeSH descriptor Dentist's Practice Patterns, this term only
#33	MeSH descriptor Health Knowledge, Attitudes, Practice, this term only

#34 MeSH descriptor Malpractice, this term only
#35 MeSH descriptor Professional Impairment, this term only
#36 MeSH descriptor Physician Impairment, this term only
#37 MeSH descriptor Medical Errors, this term only
#38 MeSH descriptor Diagnostic Errors, this term only
#39 MeSH descriptor Medication Errors explode all trees
#40 MeSH descriptor Professional Competence, this term only
#41 MeSH descriptor Clinical Competence, this term only
#42 (competence or practice NEXT pattern* or malpractice or mal NEXT practice or error*):ti,ab
#43 MeSH descriptor Education, this term only
#44 MeSH descriptor Competency-Based Education, this term only
#45 MeSH descriptor Education, Public Health Professional, this term only
#46 MeSH descriptor Education, Medical, this term only
#47 MeSH descriptor Education, Medical, Continuing, this term only
#48 MeSH descriptor Education, Nursing, this term only
#49 MeSH descriptor Education, Nursing, Continuing, this term only
#50 MeSH descriptor Education, Dental, this term only
#51 MeSH descriptor Education, Dental, Continuing, this term only
#52 MeSH descriptor Education, Pharmacy, this term only
#53 MeSH descriptor Education, Pharmacy, Continuing, this term only
#54 (educat* or train or training or trained or colloquium* or conference* or course* or lecture* or meeting* or seminar* or support* or symposi* or workshop*):ti,ab
#55 MeSH descriptor Delivery of Health Care, this term only
#56 MeSH descriptor Quality of Health Care, this term only
#57 MeSH descriptor Quality Assurance, Health Care, this term only
#58 MeSH descriptor Quality Improvement, this term only
#59 MeSH descriptor Total Quality Management, this term only
#60 MeSH descriptor Outcome and Process Assessment (Health Care), this term only
#61 MeSH descriptor Outcome Assessment (Health Care), this term only
#62 MeSH descriptor Process Assessment (Health Care), this term only
#63 MeSH descriptor Guideline Adherence, this term only
#64 MeSH descriptor Benchmarking, this term only
#65 MeSH descriptor Standard of Care, this term only
#66 MeSH descriptor Reference Standards, this term only
#67 (best NEXT practice or quality or standard* or benchmark* or adherence or requirement*):ti,ab
#68 (Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"):ti,ab,kw
#69 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or

Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or "Upper Volta" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or Chile or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Croatia or Cuba or Cyprus or Czechoslovakia or "Czech Republic" or Slovakia or "Slovak Republic"):ti,ab,kw

#70 (Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "United Arab Republic" or "El Salvador" or Eritrea or Estonia or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or Georgia or Georgian or Ghana or "Gold Coast" or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania):ti,ab,kw

#71 (Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or "Marshall Islands" or Mauritania or Mauritius or "Agalega Islands" or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or "Netherlands Antilles" or "New Caledonia" or Nicaragua or Niger or Nigeria or "Northern Mariana Islands" or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or "Puerto Rico"):ti,ab,kw

#72 (Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Kitts" or "St Kitts" or Nevis or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or "Saudi Arabia" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or Slovenia or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or "New Hebrides" or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia):ti,ab,kw

#73 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income or underserved or "under served" or deprived or poor*) NEXT (countr* or nation* or population* or world):ti,ab,kw

#74 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income) NEXT (economy or economies):ti,ab,kw

#75 low* NEXT (gdp or gnp or "gross domestic" or "gross national"):ti,ab,kw

#76 (low NEAR/3 middle NEAR/3 countr*):ti,ab,kw

#77 (lmic or lmics or "third world" or "lami country" or "lami countries"):ti,ab,kw

#78 ("transitional country" or "transitional countries"):ti,ab,kw

#79 (#2 OR #3 OR #4 OR #5 OR #6)

#80 (#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67)

#81 (#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78)

#82 (#1 AND #81)

#83 (#79 AND #80 AND #81)

#84 (#82 OR #83)

DARE (Cochrane Library)

#	Searches
#1	MeSH descriptor Public-Private Sector Partnerships, this term only
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#14	MeSH descriptor Law Enforcement, this term only
#15	MeSH descriptor Government explode all trees
#16	MeSH descriptor Government Regulation, this term only
#17	MeSH descriptor Facility Regulation and Control, this term only
#18	MeSH descriptor Policy Making, this term only
#19	MeSH descriptor Jurisprudence, this term only
#20	MeSH descriptor Mandatory Reporting, this term only
#21	MeSH descriptor Politics, this term only
#22	MeSH descriptor Legislation as Topic, this term only
#23	MeSH descriptor Legislation, Hospital, this term only
#24	MeSH descriptor Legislation, Medical, this term only
#25	MeSH descriptor Legislation, Nursing, this term only
#26	MeSH descriptor Legislation, Pharmacy, this term only
#27	MeSH descriptor Legislation, Drug, this term only

#28 MeSH descriptor Legislation, Dental, this term only

#29 (public* or stewardship* or governance or governing or coordinat* or co NEXT ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*):ti,ab

#30 MeSH descriptor Physician's Practice Patterns, this term only

#31 MeSH descriptor Nurse's Practice Patterns, this term only

#32 MeSH descriptor Dentist's Practice Patterns, this term only

#33 MeSH descriptor Health Knowledge, Attitudes, Practice, this term only

#34 MeSH descriptor Malpractice, this term only

#35 MeSH descriptor Professional Impairment, this term only

#36 MeSH descriptor Physician Impairment, this term only

#37 MeSH descriptor Medical Errors, this term only

#38 MeSH descriptor Diagnostic Errors, this term only

#39 MeSH descriptor Medication Errors explode all trees

#40 MeSH descriptor Professional Competence, this term only

#41 MeSH descriptor Clinical Competence, this term only

#42 (competence or practice NEXT pattern* or malpractice or mal NEXT practice or error*):ti,ab

#43 MeSH descriptor Education, this term only

#44 MeSH descriptor Competency-Based Education, this term only

#45 MeSH descriptor Education, Public Health Professional, this term only

#46 MeSH descriptor Education, Medical, this term only

#47 MeSH descriptor Education, Medical, Continuing, this term only

#48 MeSH descriptor Education, Nursing, this term only

#49 MeSH descriptor Education, Nursing, Continuing, this term only

#50 MeSH descriptor Education, Dental, this term only

#51 MeSH descriptor Education, Dental, Continuing, this term only

#52 MeSH descriptor Education, Pharmacy, this term only

#53 MeSH descriptor Education, Pharmacy, Continuing, this term only

#54 (educat* or train or training or trained or colloquium* or conference* or course* or lecture* or meeting* or seminar* or support* or symposi* or workshop*):ti,ab

#55 MeSH descriptor Delivery of Health Care, this term only

#56 MeSH descriptor Quality of Health Care, this term only

#57 MeSH descriptor Quality Assurance, Health Care, this term only

#58 MeSH descriptor Quality Improvement, this term only

#59 MeSH descriptor Total Quality Management, this term only

#60 MeSH descriptor Outcome and Process Assessment (Health Care), this term only

#61 MeSH descriptor Outcome Assessment (Health Care), this term only

#62 MeSH descriptor Process Assessment (Health Care), this term only

#63 MeSH descriptor Guideline Adherence, this term only

#64 MeSH descriptor Benchmarking, this term only

#65 MeSH descriptor Standard of Care, this term only

#66 MeSH descriptor Reference Standards, this term only

#67 (best NEXT practice or quality or standard* or benchmark* or adherence or requirement*):ti,ab

#68 (Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"):ti,ab,kw

#69 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or "Upper Volta" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or Chile or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Croatia or Cuba or Cyprus or Czechoslovakia or "Czech Republic" or Slovakia or "Slovak Republic"):ti,ab,kw

#70 (Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "United Arab Republic" or "El Salvador" or Eritrea or Estonia or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or Georgia or Georgian or Ghana or "Gold Coast" or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania):ti,ab,kw

#71 (Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or "Marshall Islands" or Mauritania or Mauritius or "Agalega Islands" or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or "Netherlands Antilles" or "New Caledonia" or Nicaragua or Niger or Nigeria or "Northern Mariana Islands" or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or "Puerto Rico"):ti,ab,kw

#72 (Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Kitts" or "St Kitts" or Nevis or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or "Saudi Arabia" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or Slovenia or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or "New Hebrides" or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia):ti,ab,kw

#73 (developing or less* NEXT developed or "under developed" or underdeveloped or

"middle income" or low* NEXT income or underserved or "under served" or deprived or poor*) NEXT (countr* or nation* or population* or world):ti,ab,kw

#74 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income) NEXT (economy or economies):ti,ab,kw

#75 low* NEXT (gdp or gnp or "gross domestic" or "gross national"):ti,ab,kw

#76 (low NEAR/3 middle NEAR/3 countr*):ti,ab,kw

#77 (lmic or lmics or "third world" or "lami country" or "lami countries"):ti,ab,kw

#78 ("transitional country" or "transitional countries"):ti,ab,kw

#79 (#2 OR #3 OR #4 OR #5 OR #6)

#80 (#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67)

#81 (#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78)

#82 (#1 AND #81)

#83 (#79 AND #80 AND #81)

#84 (#82 OR #83)

MEDLINE In-Process & Other Non-Indexed Citations and **MEDLINE** (Ovid)

#	**Searches**
1	Public-Private Sector Partnerships/
2	Private Sector/
3	Private Practice/
4	Hospitals, Private/
5	Privatization/
6	privat*.ti,ab.
7	or/2-6
8	Public Sector/
9	Public Policy/
10	Health Policy/
11	State Medicine/
12	State Dentistry/
13	Health Care Reform/
14	Health Planning/
15	Social Control, Formal/
16	Law Enforcement/
17	exp Government/
18	Government Regulation/
19	"Facility Regulation and Control"/

20 Policy Making/
21 Jurisprudence/
22 Mandatory Reporting/
23 Politics/
24 Legislation as Topic/
25 Legislation, Hospital/
26 Legislation, Medical/
27 Legislation, Nursing/
28 Legislation, Pharmacy/
29 Legislation, Drug/
30 Legislation, Dental/
31 (public* or stewardship* or governance or governing or coordinat* or co ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*).ti,ab.
32 or/8-31
33 Physician's Practice Patterns/
34 Nurse's Practice Patterns/
35 Dentist's Practice Patterns/
36 Health Knowledge, Attitudes, Practice/
37 Malpractice/
38 Professional Impairment/
39 Physician Impairment/
40 Medical Errors/
41 Diagnostic Errors/
42 Medication Errors/
43 Professional Competence/
44 Clinical Competence/
45 (competence or practice pattern* or malpractice or mal practice or error*).ti,ab.
46 or/33-45
47 Education/
48 Competency-Based Education/
49 Education, Public Health Professional/
50 Education, Medical/
51 Education, Medical, Continuing/
52 Education, Nursing/
53 Education, Nursing, Continuing/
54 Education, Dental/
55 Education, Dental, Continuing/
56 Education, Pharmacy/
57 Education, Pharmacy, Continuing/
58 (educat* or train or training or trained or colloquium? or conference? or course? or

lecture? or meeting? or seminar? or support* or symposi* or workshop?).ti,ab.

59 or/47-58

60 "Delivery of Health Care"/

61 "Quality of Health Care"/

62 Quality Assurance, Health Care/

63 Quality Improvement/

64 Total Quality Management/

65 "Outcome and Process Assessment (health care)"/

66 "Outcome Assessment (health care)"/

67 "Process Assessment (health care)"/

68 Guideline Adherence/

69 Benchmarking/

70 "Standard of Care"/

71 Reference Standards/

72 (best practice or quality or standard* or benchmark* or adherence or requirement*).ti,ab.

73 or/60-72

74 Developing Countries.sh,kf.

75 (Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,kf,ti,ab,cp.

76 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines

or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp.

77 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

78 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

79 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

80 (low adj3 middle adj3 countr*).ti,ab.

81 (lmic or lmics or third world or lami countr*).ti,ab.

82 transitional countr*.ti,ab.

83 or/74-82

84 randomized controlled trial.pt.

85 controlled clinical trial.pt.

86 multicenter study.pt.

87 (randomis* or randomiz* or randomly or random allocat*).ti,ab.

88 groups.ab.

89 (trial or multicenter or multi center or multicentre or multi centre).ti.

90 (intervention* or controlled or control group or compare or compared or (before adj5 after) or (pre adj5 post) or pretest or pre test or posttest or post test or quasiexperiment* or quasi experiment* or evaluat* or effect or impact or time series or time point? or repeated measur*).ti,ab.

91 or/84-90

92 Animals/

93 Humans/

94 92 not (92 and 93)

95 comment.pt.

96 editorial.pt.

97 cochrane database of systematic reviews.jn.

98 comment on.cm.

99 review.pt.

100 review.ti.

101 or/94-100

102 91 not 101
103 1 and 83 and 102
104 7 and 32 and 83 and 102
105 7 and 46 and 83 and 102
106 7 and 59 and 83 and 102
107 7 and 73 and 83 and 102
108 or/103-107

EMBASE (Ovid)

#	**Searches**
1	"organization and management"/
2	government regulation/
3	social control/
4	professional competence/
5	clinical competence/
6	quality control/
7	health care quality/
8	total quality management/
9	or/2-8
10	1 and 9
11	(privat* adj6 (public* or stewardship* or governance or governing or coordinat* or co ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*)).ti,ab.
12	(privat* adj6 (competence or practice pattern* or malpractice or mal practice or error*)).ti,ab.
13	(privat* adj6 (educat* or train or training or trained or colloquium? or conference? or course? or lecture? or meeting? or seminar? or support* or symposi* or workshop?)).ti,ab.
14	(privat* adj6 (best practice or quality or standard* or benchmark* or adherence or requirement*)).ti,ab.
15	or/11-14
16	10 or 15
17	Developing Country.sh.
18	(Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,ti,ab,cp.
19	(Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or

Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,cp.

20 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

21 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

22 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

23 (low adj3 middle adj3 countr*).ti,ab.

24 (lmic or lmics or third world or lami countr*).ti,ab.

25 transitional countr*.ti,ab.

26 or/17-25

27 Randomized Controlled Trial/

28 Controlled Clinical Trial/

29 Quasi Experimental Study/

30 Pretest Posttest Control Group Design/

31 Time Series Analysis/

32 Experimental Design/

33 Multicenter Study/

34 (randomis* or randomiz* or randomly or random allocat*).ti,ab.

35 groups.ab.

36 (trial or multicentre or multicenter or multi centre or multi center).ti.

37 (intervention* or controlled or control group or compare or compared or (before adj5 after) or (pre adj5 post) or pretest or pre test or posttest or post test or quasiexperiment* or quasi experiment* or evaluat* or effect or impact or time series or time point? or repeated measur*).ti,ab.

38 or/27-37

39 review.ti.

40 "cochrane database of systematic reviews".jn.

41 Nonhuman/

42 or/39-41

43 38 not 42

44 16 and 26 and 43

45 15 and 26 and 43

46 limit 45 to embase

ISI Web of Knowledge (Topic search)

Searches

TS=privat*

AND

TS=(stewardship* or governance or governing or policy or policies or politics or coordinat* or legislat* or regulat* or supervis* or monitor*)

AND

TS=(health* or medical* or pharmac* or drug or drugs or doctor* or physiscan* or nurse or nurses or hospital*)

AND

TS=(developing or less developed or lesser developed or underdeveloped or under developed or middle income or low income or lower income or transitional) AND TS=(countr* or nation$ or population$ or world) OR TS=(lmic or lmics)

AND

TS=(randomis* or randomiz* or impact or effect or evaluat* or control* or intervention* or "time series" or "time point" or "time points" or "repeated measure" or "repeated measures" or quasiexperiment* or "quasi experiment")

OR

TS=privat*

AND

TS=public*

AND

TS=(partnership$ or engagement$ or collaborat*)

AND

TS=(health* or medical* or pharmac* or drug or drugs or doctor* or physiscan* or nurse or nurses or hospital*)

AND

TS=(developing or less developed or lesser developed or underdeveloped or under developed or middle income or low income or lower income or transitional) AND TS=(countr* or nation$ or population$ or world) OR TS=(lmic or lmics)

AND

TS=(randomis* or randomiz* or impact or effect or evaluat* or control* or intervention* or "time series" or "time point" or "time points" or "repeated measure" or "repeated measures" or quasiexperiment* or "quasi experiment")

WHOLIS (WHO)

Searched in field: *Words or phrase*

privat$ **AND** public **AND** stewardship$ or govern$ or policy or policies or politics or coordinat$ or co ordinat$ or legislat$ or regulat$ or supervis$ or monitor$ or partner$ or engagement$ or collaborat$ **AND** random$ or impact$ or effect$ or evaluat$ or control$ or intervention or time series or time point$ or repeated measure$ or quasiexperiment or quasi experiment

A6.2. Data extraction form

Review title

Study ID *(surname of first author and year first full report of study was published e.g. Smith 2001)*

Report ID *(if different to Study ID)*	**Report IDs of other reports of this study** *(e.g. duplicate publications, follow-up studies)*

Notes:

General Information

Date form completed *(dd/mm/yyyy)*	
Name/ID of person extracting data	
Reference citation	
Study author contact details	
Publication type *(e.g. full report, abstract, letter)*	
Notes:	

Study eligibility

Study Characteristics	**Eligibility criteria** *(Insert inclusion criteria for each characteristic as defined in the Protocol)*	**Eligibility criteria met?** Yes	No	Unclear	**Location in text or source** *(pg & ¶/fig/table/other)*
Type of study	Randomised Controlled Trial	☐	☐	☐	
	Quasi-randomised Controlled Trial	☐	☐	☐	
	Controlled Before and After Study • Contemporaneous data collection • Comparable control site • At least 2 x intervention and 2 x control clusters	☐	☐	☐	
	Interrupted Time Series • At least 3 time points before and 3 after the intervention • Clearly defined intervention point	☐	☐	☐	
	Other design (specify):	☐	☐	☐	
Participants		☐	☐	☐	
Types of intervention		☐	☐	☐	
Types of outcome measures		☐	☐	☐	

INCLUDE ☐ **EXCLUDE** ☐

Reason for exclusion	
Notes:	

DO NOT PROCEED IF STUDY EXCLUDED FROM REVIEW

Characteristics of included studies

Methods

	Descriptions as stated in report/paper	**Location in text or source** *(pg & ¶/fig/table/other)*
Aim of study *(e.g. efficacy, equivalence, pragmatic)*		
Design *(e.g. parallel, crossover, non-RCT)*		
Unit of allocation *(by individuals, cluster/ groups or body parts)*		
Start date		
End date		
Duration of participation *(from recruitment to last follow-up)*		
Ethical approval needed/ obtained for study	☐ Yes ☐ No ☐ Unclear	
Notes:		

Participants

	Description *Include comparative information for each intervention or comparison group if available*	**Location in text or source** *(pg & ¶/fig/table/other)*
Population description *(from which study participants are drawn)*		
Setting *(including location and social context)*		
Inclusion criteria		
Exclusion criteria		
Method of recruitment of participants *(e.g. phone, mail, clinic patients)*		
Informed consent obtained	☐ Yes ☐ No ☐ Unclear	
Total no. randomised *(or total pop. at start of study for NRCTs)*		
Clusters *(if applicable, no., type, no. people per cluster)*		

Baseline imbalances		
Withdrawals and exclusions *(if not provided below by outcome)*		
Age		
Sex		
Race/Ethnicity		
Severity of illness		
Co-morbidities		
Other relevant sociodemographics		
Subgroups measured		
Subgroups reported		
Notes:		

Intervention groups

Intervention Group 1

	Description as stated in report/paper	**Location in text or source** *(pg & ¶/fig/table/other)*
Group name		
No. randomised to group *(specify whether no. people or clusters)*		
Theoretical basis *(include key references)*		
Description *(include sufficient detail for replication, e.g. content, dose, components)*		
Duration of treatment period		
Timing *(e.g. frequency, duration of each episode)*		
Delivery *(e.g. mechanism, medium, intensity, fidelity)*		
Providers *(e.g. no., profession, training, ethnicity etc if relevant)*		
Co-interventions		
Economic variables *(i.e. intervention cost, changes in other costs as result of intervention)*		
Resource requirements *(e.g. staff numbers, cold chain, equipment)*		
Integrity of delivery		
Compliance		
Notes:		

Comparison groups

	Description as stated in report/paper	Location in text or source *(pg & ¶/fig/table/other)*
Group name		
No. randomised to group *(specify whether no. people or clusters)*		
Theoretical basis *(include key references)*		
Description *(include sufficient detail for replication, e.g. content, dose, components)*		
Duration of treatment period		
Timing *(e.g. frequency, duration of each episode)*		
Delivery *(e.g. mechanism, medium, intensity, fidelity)*		
Providers *(e.g. no., profession, training, ethnicity etc. if relevant)*		
Co-interventions		
Economic variables *(i.e. intervention cost, changes in other costs as result of intervention)*		
Resource requirements *(e.g. staff numbers, cold chain, equipment)*		
Integrity of delivery		
Compliance		
Notes:		

Outcomes

	Description as stated in report/paper	Location in text or source *(pg & ¶/fig/table/other)*
Time points measured *(specify whether from start or end of intervention)*		
Time points reported		
Outcome definition *(with diagnostic criteria if relevant)*		
Person measuring/ reporting		
Unit of measurement *(if relevant)*		
Scales: upper and lower limits *(indicate whether high or low score is good)*		

Is outcome/tool validated?	☐ Yes ☐ No ☐ Unclear		
Imputation of missing data *(e.g. assumptions made for ITT analysis)*			
Assumed risk estimate *(e.g. baseline or population risk noted in Background)*			
Power			
Notes:			

Risk of Bias assessment

Domain	**Risk of bias** Low risk ☐ High risk ☐ Unclear ☐	**Support for judgement** *(include direct quotes where available with explanatory comments)*	**Location in text or source** *(pg & ¶/fig/table/other)*
Random sequence generation *(selection bias)*	☐ ☐ ☐		
Allocation concealment *(selection bias)*	☐ ☐ ☐		
Blinding of participants and personnel *(performance bias)*	☐ ☐ ☐	**Outcome group: All/**	
(if separate judgement by outcome(s) required)	☐ ☐ ☐	**Outcome group:**	
Blinding of outcome assessment *(detection bias)*	☐ ☐ ☐	**Outcome group: All/**	
(if separate judgement by outcome(s) required)	☐ ☐ ☐	**Outcome group:**	
Incomplete outcome data *(attrition bias)*	☐ ☐ ☐	**Outcome group: All/**	
(if separate judgement by outcome(s) required)	☐ ☐ ☐	**Outcome group:**	
Selective outcome reporting? *(reporting bias)*	☐ ☐ ☐		
Other bias	☐ ☐ ☐		
Notes:			

Data and analysis

For RCT/CCT

Dichotomous outcome

	Description as stated in report/paper	**Location in text or source** *(pg & ¶/fig/table/other)*
Comparison		
Outcome		
Subgroup		

Time point *(specify from start or end of intervention)*					
Results	**Intervention**		**Comparison**		
	No. with event	Total in group	No. with event	Total in group	
Any other results reported *(e.g. odds ratio, risk difference, CI or P value)*					
No. missing participants					
Reasons missing					
No. participants moved from other group					
Reasons moved					
Unit of analysis *(by individuals, cluster/groups or body parts)*					
Statistical methods used and appropriateness of these *(e.g. adjustment for correlation)*					
Reanalysis required? *(specify, e.g. correlation adjustment)*	☐ Yes ☐ No ☐ Unclear				
Reanalysis possible?	☐ Yes ☐ No ☐ Unclear				
Reanalysed results					
Notes:					

For RCT/CCT

Continuous outcome

	Description as stated in report/paper					**Location in text or source** *(pg & ¶ /fig/table/other)*
Comparison						
Outcome						
Subgroup						
Time point *(specify from start or end of intervention)*						
Post-intervention or change from baseline?						
Results	**Intervention**			**Comparison**		
	Mean	SD *(or other variance, specify)*	No. participants	Mean	SD *(or other variance, specify)*	No. participants
Any other results reported *(e.g. mean difference, CI, P value)*						
No. missing participants						
Reasons missing						
No. participants moved from other group						

Reasons moved			
Unit of analysis *(individuals, cluster/ groups or body parts)*			
Statistical methods used and appropriateness of these *(e.g. adjustment for correlation)*			
Reanalysis required? *(specify)*	☐ Yes ☐ No ☐ Unclear		
Reanalysis possible?	☐ Yes ☐ No ☐ Unclear		
Reanalysed results			
Notes:			

For RCT/CCT

Other outcome

	Description as stated in report/paper				**Location in text or source** *(pg & ¶/fig/table/other)*
Comparison					
Outcome					
Subgroup					
Time point *(specify from start or end of intervention)*					
No. participant	Intervention		Control		
Results	Intervention result	SD (or other variance)	Control result	SD (or other variance)	
	Overall results		SE (or other variance)		
Any other results reported					
No. missing participants					
Reasons missing					
No. participants moved from other group					
Reasons moved					
Unit of analysis *(by individuals, cluster/groups or body parts)*					
Statistical methods used and appropriateness of these					
Reanalysis required? *(specify)*	☐ Yes ☐ No ☐ Unclear				

Reanalysis possible?	☐ Yes ☐ No ☐ Unclear
Reanalysed results	
Notes:	

For CBA

	Description as stated in report/paper				**Location in text or source** *(pg & ¶/fig/table/other)*
Comparison					
Outcome					
Subgroup					
Time point *(specify from start or end of intervention)*					
Post-intervention or change from baseline?					
No. participants	Intervention		Control		
Results	Intervention result	SD *(or other variance, specify)*	Control result	SD *(or other variance, specify)*	
	Overall results		SE *(or other variance, specify)*		
Any other results reported					
No. missing participants					
Reasons missing					
No. participants moved from other group					
Reasons moved					
Unit of analysis *(individuals, clusters/groups or body parts)*					
Statistical methods used and appropriateness of these					
Reanalysis required? *(specify)*	☐ Yes ☐ No ☐ Unclear				
Reanalysis possible?	☐ Yes ☐ No ☐ Unclear				
Reanalysed results					
Notes:					

For ITS

	Description as stated in report/paper	**Location in text or source** *(pg & ¶/fig/table/other)*
Comparison		

Outcome					
Subgroup					
Length of time points measured *(e.g. days, months)*					
Total period measured					
No. participants measured					
No. missing participants					
Reasons missing					
	Pre-intervention		**Post-intervention**		
No. time points measured					
Mean value *(with variance measure)*					
Any other results reported					
Unit of analysis *(individuals or cluster groups)*					
Statistical methods used and appropriateness of these					
Reanalysis required? *(specify)*	☐ Yes ☐ No ☐ Unclear				
Reanalysis possible?	☐ Yes ☐ No ☐ Unclear				
Individual time point results					
Read from figure?	☐ Yes ☐ No				
Reanalysed results	**Change in level**	**SE**	**Change in slope**	**SE**	
Notes:					

Other information

	Description as stated in report/paper	**Location in text or source** *(pg & ¶/fig/table/other)*
Key conclusions of study authors		
References to other relevant studies		
Correspondence required for further study information *(from whom, what and when)*		

Adapted from Cochrane Effective Practice and Organizational of Care Group (EPOC) data collection form

B: REVIEW

ABSTRACT

Background

Governments have the responsibility to provide basic health services. However, the public sector does not provide high quality health services accessible to all. This explains why private sector plays a major role but the health care provided is not always of high quality. Therefore, there is a need for public-private sector collaboration in order to increase access to quality services.

Objectives

To assess the effects of government policies on regulation, training or coordination of health services provided by the private for-profit sector in low and middle-income countries.

Search methods

In Jan 2012, we searched the Cochrane Central Register of Controlled, Medline, EMBASE, WHO Library Information System, Web of science, Database of Abstracts of Reviews of Effectiveness, Cochrane Database of Systematic Reviews, and the WHO Clinical Trials Platform.

Selection criteria

Randomised controlled trials and non-randomised control trials which include controlled clinical trials, interrupted time series designs , controlled before-after studies, of regulation, training and coordination intervention in low and middle income countries.

Data collection and analysis

Two authors independently assessed studies for inclusion. The effects of interventions are compared using risk ratios (RR) or Standardized mean difference, and presented with 95% confidence intervals (CI). The quality of the evidence was assessed using GRADE.

Results

We identified 7629 studies from the electronic search, 33 of which were potentially eligible. We excluded 19 of these studies because they were descriptive in nature and did not involve a rigorous evaluation of training, regulation, or coordination of private for-profit healthcare providers. The remaining 14 studies met our inclusion criteria: six individual randomised controlled trials, three clusters randomised controlled trials, two controlled before and after studies and one controlled clinical trial. Thirteen studies assessed training, four assessed regulation, and none assessed coordination. These studies generally had a high risk of bias. Seven of the 13 studies on training were carried out in Africa and the rest in Asia. These studies evaluated a range of private for profit services from pharmaceutical practices to prescribing practices. All the four studies on regulation were carried out in Asia i.e. Vietnam (2 studies), Thailand and Lao. They mostly targeted private for-profit pharmacy practices. The pooled results show no evidence of an effect for individually randomised controlled trials (6 studies, 2956 participants, RR 0.99, 95% CI 0.70 to 1.39, I^2=96%), controlled clinical trials (1 study, 171 participants, RR 0.89, 95% CI 0.74 to 1.06), and controlled before and after studies (2 studies, 199 participants, RR 1.37, 95% CI 0.81 to 2.33, I^2=0%). However, cluster randomised controlled trials show significant beneficial effects on quality of care among those who received training compared to those were not offered training (3 studies, 1154 participants, RR 3.07, 95% CI 1.55 to 6.08, I^2=91%). In addition one cluster randomised controlled trial that reported continuous data also shows a beneficial effect of training (1 study, N=4445, mean difference 0.16 CI 0.10 to 0.21). The pooled results of regulation do not rule out either a beneficial or harmful effect on quality of care (2 studies, 306 participants, RR 1.05, 95% CI 0.81 to 1.37, I^2=49%). The remaining two studies reported continuous data; one cluster randomised controlled trial shows a small beneficial effect (1 study, N=4445, mean difference -0.07, CI -0.13 to -0.01) while the other study, an individual

randomised controlled trial did not show any evidence of effect (1 study, N=92, mean difference 0.07, CI -0.34 to -0.48). We did not find an eligible study on coordination. None of the studies reported data on mortality or morbidity, resource use, adverse effects, satisfaction, or attitudes.

Conclusions

Currently available evidence shows that training probably improves quality of health care in the by private for-profit sector. However, the currently available evidence does not rule out a beneficial or harmful effect of regulation on the quality of care provided by the private for-profit sector. We found no data on the effects of coordination, thus rigorous studies on this intervention are needed. We recommend that further research on the interventions assessed in this review should be of high quality and should assess other policy-relevant outcomes such as mortality, morbidity, resource use, adverse effects, attitudes, and satisfaction.

B1. Introduction

Governments have the responsibility to provide basic services, including health care, to their citizens. However, the public sector is not sufficiently well-equipped and financed to provide high quality health services that are accessible to all. [1] This explains why private healthcare providers play a major role in health service provision in many low and middle-income countries.[2-6] Given the need to work with the private sector to increase access to services, various strategies have been proposed that governments can employ to engage the private sector in service provision.[6] These include regulation, contracting, financing and social marketing, training, and coordination.[1, 6] These interventions are generally applied in combination to reach two important goals: (1) improving the quality of care delivered by existing service providers; and (2) expanding the coverage of private sector services and rationalising this coverage with that of public sector providers. [6] However, there is a paucity of systematic reviews on the effects of these interventions on the quality and accessibility of private for-profit health care in low and middle-income countries.[1, 2, 6] We therefore initiated this review to assess the public stewardship of the private for-profit health sector in low and middle-income countries.

Scarce government resources in low and middle-income countries have led to a decline in the quantity and quality of public health services.[2, 50, 6, 7] These public health failures have led to a drastic increase in private providers of health services, both for-profit and not-for profit, in many low and middle-income countries.[1-6, 10, 50, 51] The consequence of this expansion in the private health sector is that (poor) communities spend outsized amounts of money for private health services; at times when cheaper public sector alternatives are available.[3, 4, 6] However, the suitability and quality of the services provided by the private health sector is increasingly being questioned.[2, 6]

Public stewardship refers to government policies, regulatory mechanisms and implementation strategies for ensuring guidance and accountability.[10] We will focus on three types of strategic interventions, namely, regulation, training, and coordination; and exclude potential interventions which are already covered by systematic reviews published in the last three years such as social marketing and franchising, [46] contracting, [48] and pay for performance.[49]. Regulation refers to the setting and enforcing of standards for the private sector; training involves educating and supporting private service providers; and coordination entails organising and creating alliances among private and public sector healthcare providers.

A systematic review published in 2007 found "evidence that effective public-private partnerships can increase access, improve equity, and raise quality of health services". [4] However, using the GRADE approach, [8, 9] this evidence on the effectiveness of interventions for working with the private for-profit sector to improve the utilisation and quality of health services for the poor in the low and middle-countries was found to be of low quality.[10] The implication of the low quality of the evidence is that further research on this topic is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Therefore there is a great need for current best evidence on interventions for working with private for-profit healthcare providers to improve access and quality of health services. We plan to review the currently available evidence on public sector efforts to work with private for-profit health service providers to improve existing health services and expand and rationalise the coverage of these services.[6]

B2. Objectives

To assess the effects of public sector regulation, training, or coordination of health services provided by the private for-profit sector in low and middle-income countries.

B3. Methods

B3.1. Criteria for considering studies for this review

B3.1.1. Types of studies

The review includes:

- Randomised controlled trials (RCTs) including individually-randomised and cluster-randomised controlled trials
- Non-randomised control trials
    - Controlled clinical trials (CCTs)
    - Interrupted time series designs (ITS) with at least three measurements before and after introducing the intervention
    - Controlled before-after studies (CBAs) with at least two intervention groups and at least two comparable control groups, with simultaneous data collection.

B3.1.2. Types of participants

Studies taking place in low and middle income countries as defined by the World Bank. All types of health services provided by for- profit providers will be included in our review.

B3.1.3. Types of interventions

Regulation, training, and coordination; of any intensity or duration, implemented by the public sector. The control must be a no-intervention or alternate-intervention group.

Regulation refers to the setting and enforcing of standards for the private sector; training involves educating and supporting private service providers; and coordination entails organising and creating alliances among private and public healthcare providers.

B3.1.4. Types of outcome measures

B3.1.4.1.1. Primary outcomes

- Quality of care (compliance with desired behaviour or guidance)·

B3.1.4.1.2. Secondary outcomes

The following other outcomes of interest are included if reported in included studies:

- Mortality or morbidity
- Resource use·
- Adverse effects (e.g. undesirable impacts on existing public or private services, inappropriate use of services, distortions in the provision of services)
- Satisfaction of both health provider and patient
- Attitudes of both health provider and patient

B3.2. Search methods for identification of studies

We searched the following electronic databases for primary studies:

- The Cochrane Central Register of Controlled (CENTRAL), (10 Jan 2012)
- MEDLINE In-Process & Other Non-Indexed Citations and MEDLINE, Ovid (1946 to present) (10 Jan 2012)
- EMBASE, Ovid (from 1980 to 2012 week 03) (10 Jan 2012)
- WHOLIS and WHO International Clinical Trials Platform (10 Jan 2012)
- Science Citation Index Expanded (SCI-EXPANDED) (1975 to present) (10 Jan 2012)
- Social Sciences Citation Index (SSCI) (1975 to present) (10 Jan 2012).

In addition, we searched the Cochrane Database of Systematic Reviews (10 Jan 2012), and the Database of Abstracts of Reviews of Effectiveness (10 Jan 2012) for previous relevant reviews. We checked the reference lists of relevant previous reviews [1-6, 47] and full-text articles reviewed for inclusion in this review.

We developed a sensitive and previously validated search strategy for RCTs, non-RCTs, CBAs, and ITS studies combined with relevant MeSH and free-text terms relating to health regulation, training and coordination literature for low and middle-income countries. We placed no language or date restrictions on the search strategy. We translated the MEDLINE (Ovid) search strategy into the other databases using the appropriate controlled vocabulary.

B3.3. Data collection and analysis

B3.3.1. Selection of studies

LA screened the titles and abstracts of outputs from the searches using the screening guide to identify studies which met the inclusion criteria and CW verified the selected records. We then retrieved all records deemed potentially eligible by at least one of the two authors, and discard the rest. LA obtained the full text of all potentially eligible articles, and LA and CW independently examined each of these for eligibility. Each of us compiled a list of studies which he/she believed met the inclusion criteria. Both authors compared the list and resolving discrepancies by discussion and consensus.

B3.3.2. Data extraction and management

Two authors (LA, CW) independently extracted descriptive and outcome data for each paper using a pre-designed data collection form. Both authors compared the list of included and excluded studies, resolving any discrepancies by discussion and consensus. (LA) entered the data into Review Manager (RevMan) 5.1. (CW) performed double checks in RevMan to ensure that there were no errors in the data entered.

B3.3.3. Assessment of risk of bias in included studies

We assessed the risk of bias based on six standard domains: [19]

- Sequence generation
- Concealment of allocation
- Blinded or objective assessment of primary outcome(s)
- Incomplete outcome data
- Selective outcome reporting
- Other source of bias.

For each included study, we reported our assessment of risk of bias for each domain i.e. low, high and unclear together with a descriptive summary of the information that influenced our

judgment. The authors compared the results of their independent assessments of risk of bias and resolved any discrepancies by discussion and consensus.

B3.3.4. Measures of treatment effect

We grouped measures of treatment effect based on outcome variables. For dichotomous outcomes, results from each trial were expressed as a risk ratio (RR) with 95% confidence intervals. Continuous outcomes were presented in several ways; when absolute values of post-intervention means and standard deviations (SD) were given, using the same rating across studies, we used these to calculate the mean difference (MD) and 95% confidence intervals. If different scales are used to measure the same outcomes, we calculated the standardised mean difference (SMD) with 95% confidence intervals and then combine these in a meta-analysis.

B3.3.5. Unit of analysis issues

Due to insufficient information available to control for clustering, we entered data into RevMan using individuals as the unit of analysis. We then performed sensitivity analyses to assess the potential bias that may have occurred as a result of the inadequately controlled clustered trials.

B3.3.6. Dealing with missing data

Where necessary, we contacted the corresponding authors of included studies to supply any unreported data but we did not get response. If a study reports outcomes only for participants completing the trial or only for participants who followed the protocol, we contacted the authors and ask them to provide additional information to permit us to conduct meta-analyses by intention-to-treat. We described missing data and dropouts for each included study in the Risk of Bias table, and discuss the extent to which the missing data alters our results.

B3.3.7. Assessment of heterogeneity

For those studies of similar interventions that report similar outcomes, we examined statistical heterogeneity between study results using the Chi^2 test of homogeneity (with significance defined at the 10% alpha-level), and quantify any statistical heterogeneity between study results using the I^2 statistic.

B3.3.8. Data synthesis

We analysed data using Review Manager 5.[11] We conducted meta-analysis when included randomised trials were similar in terms of participants, interventions, and outcomes. We pooled the data using random-effects method because we detected significant heterogeneity and considered it was clinically meaningful to combine the trials by intervention type.
In addition, we used the GRADE approach to summarise the quality of the evidence on the effects on each outcome. [9]

B3.3.9. Sensitivity analysis

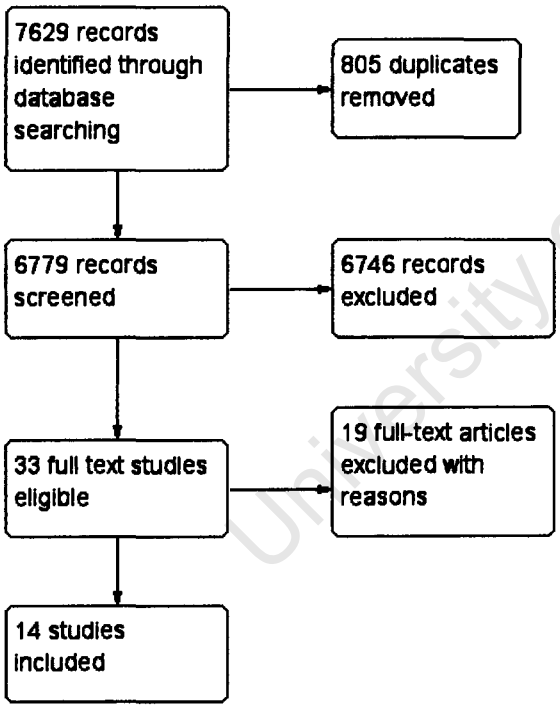
We planned to perform sensitivity analyses to explore the effect of risk of bias on the robustness of our findings. However, this was not possible because all the studies generally had a high risk of bias.

B4. Results

B4.1. Description of studies

We obtained 7,629 titles and abstracts which were all in English language from the electronic search of 8 databases after which we removed 850 duplicates. We screened 6779 records of which 6746 were not relevant, thus we retrieved the full text of 33 potential eligible studies and reviewed for inclusion. Of these, 14 articles met our inclusion criteria [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26] (see Table 1) and the remaining 19 were excluded with reasons as explained later (Table 2). A flow diagram of studies included in the analysis is shown in Figure 1 below.

Figure 1: Study flow diagram



B4.2. Included studies

Fourteen studies on regulation and training of private-for-profit in low and middle income countries were included. Eleven were randomised control studies(4 cluster randomised controlled trial and 7 individual randomised controlled trial, [13, 14, 16, 17, 18, 19, 20, 21, 23, 24, 25] two controlled before and after studies, [15, 22] and one controlled clinical trial.[26]

Thirteen studies had interventions that concerned training; [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26] four studies assessed regulation [16, 17, 18, 25] and no studies evaluated coordination.

Intervention characteristic s

Regulation

Four studies evaluated regulation (N=4831 participants). [16, 17, 18, 25] Of these, one study [25] evaluated only regulation (N=92) while the other three [16, 17, 18] had a multi-faceted intervention (N=4739 participants), consisting of regulation, training and peer review/influence.

The regulatory intervention in Lao Peoples Democratic Republic involved intensive supervision of the quality of pharmacy services, applying sanctions when rules were violated, and providing up-to-date regulatory documents and information about particular areas needing improvements. [25] The study compared districts with active regulation districts compared to districts with no intervention. As indicated earlier, the other three studies [16, 17, 18] evaluated a multi-faceted intervention which involved regulation, training and peer review. Each intervention lasted three months, with a gap of four months before the next intervention. Two studies [16 18] were performed in Hanoi, Vietnam while one study [17] was performed in Hanoi, Vietnam and Bangkok, Thailand. The studies compared districts with multi-faceted intervention to districts with no intervention as control. All pharmacists who received multifaceted intervention received all three interventions as a set. Enforcement regulation was performed by pharmacy inspectors while training interventions assessed educational visits by senior researchers. Peer review/ influence consisted of using group leaders and representatives of the pharmacy association as opinion leaders to influence practice.

Training

Thirteen studies [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26] evaluated training (N=8925 participants). Of these studies; Ten [13, 14, 15, 19, 20, 21, 22, 23, 24, 26] evaluated only training (N= 4169) while three

studies [16,17,18] had a multifaceted intervention (N =311 participants/ 4445 encounters) which combined training with regulation and peer review/influence.

Training covered different types of private providers: three targeted private doctors, [14, 15, 22] six targeted private pharmacy workers/drug retailers, [13, 16, 17, 18,21,24] one targeted private dentists [19] and three targeted a mix of provider types. [20, 23,26] Training aimed to improve the quality of care of a range of different conditions; six studies focused on treatment of childhood illness, [13, 15, 16, 21, 22, 24] three studies addressed quality of sexually transmitted infection (STI) treatment [18, 20, 23], two studies assessed dispensing of antibiotics [17, 26] and the remaining two studies addressed other health issue . [14, 19]

Coordination

We did not identify an eligible study that assessed coordination of private-for-profit providers.

Outcome characteristics

Various kinds of indicators reported in each study can be seen in Table 1 below but these were broadly categorized as quality of care. All 14 included studies [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26] reported on change in quality of care. None of the studies reported data on our secondary outcomes.

Table 1: Characteristics of included studies

Intervention evaluated	Location and date	Study design	Description of intervention	Outcome measures
Regulation.				
Regulation of pharmacy practice [Stenson et al (2001) [25]]	Savannakhet province, Lao P.D.R; 1988	Individual randomized controlled study	Intervention: Intensive supervision of quality of services of private pharmacies Control: regular service	Change of the quality of private pharmacy practice(pharmacy indicators)
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2002)[16]]	Hanoi; Vietnam; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring. Control: No intervention	Change in practice for correct management of tracer conditions
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2005) [17]]	Hanoi; Vietnam, and Bankok,Thailand; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring in two countries. Control: No intervention	Change in the dispensing practices of antibiotics in Hanoi and Bangkok.
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chuc et al (2002) [18]]	Hanoi,Vietnam; 1997	A clustered randomized controlled trial	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement and peer monitoring. Control: No intervention	Correct symptomatic treatment of sexually transmitted disease (STD)

Intervention evaluated	Location and date	Study design	Description of intervention	Outcome measures
Training				
Training of drug outlet sellers.[Abuya et al (2009) [13]]	Kwale, Makueni and Busia in Kenya; 2002	Cluster randomized trial.	Intervention: A 2 day workshop of trainingon malaria.Surrogate clients were used to pose as patients and retail audits were used to collect information on the outlets and retailers. Control: No training	Retailers' knowledge on the treatment of childhood malaria
Training on prescription writing on doctors [Akoria et al (2008)[14]]	Benin City, Southern Nigeria; 2000	Individual randomized control trial	Intervention: 20-30 min workshop face to face and seminar on prescription writing. Control: No education	Improving prescription writing among doctors in private sectors with doses of medicines prescribed as an example.
Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2002)[16]]	Hanoi, Vietnam; 1998	Individual randomized controlled study	Intervention; Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring Control: No intervention.	Correct management of tracer conditions
Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2005) [17]]	Hanoi, Vietnam, and Bankok,Thailand; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring in two countries. Control: No intervention.	Change in the dispensing practices of antibiotics
Training of private doctors on management of ARI and diarrhoea in children [Bonjalil et al (1999)[15]]	Tlaxcala State, Mexico; 1993	Controlled before and after study	Intervention: In-service training through 5-day course on diarrhoea and ARI Control: No training	Correct management of diarrhoea / acute respiratory infection (ARI)
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chuc et al (2002)[18]]	Hanoi, Vietnam; 1997	A clustered randomized controlled trial with a time series design	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement and peer monitoring. Control: No intervention	Correct symptomatic treatment of sexually transmitted diseases(STD)

Training of private dentist on use of sealants[Farsi (1999)[19]]	Jeddah,Kingdom of Saudia; no date	Individual randomized control trial	Intervention: Training on use of scalants. Control: No training	Change in use of sealants.
Training of both health worker and adolescent on STI [Harrison et al (2000)[20]]	KwaZulu/Natal, South Africa; 1996	Cluster-randomized design	Intervention: Training and supervision of health workers in a comprehensive approach to STD syndromic case management. Control: No training	Correct syndromic drug treatment
Retail training of drug outlets workers.[Kagwana et al (2011) [21]]	Butere-Mumias, Teso and Busia in Kenya; 2008	Cluster randomised controlled design	Intervention: A one-day malaria-related training was attended by outlet staff. Control: No training	Correct management of childhood malaria
Training of physicians.[Obua et al (2004)[22]]	Masaka,Jinja and Kampala in Uganda; no date.	Comparison group design	Intervention: One day educational workshop on guidelines and treatment of common conditions. pre-university school leavers aged 19-22 years were recruited and trained to simulate the symptoms and signs. Control: No training	Effect of intervention on treatment of acute respiratory infection (ARI)
Training of private doctors, pharmacy workers and patent medicine vendors on STI management [Okonofua et al (2003)[23]]	Western section of Benin City, Edo State, Nigeria; 1997	Individual randomized control trial	Intervention: Training on STI diagnosis and treatment, including 30 hours of lectures, demonstrations, practical exercises. Control: No training	Correct management of sexually transmitted diseases(STD)
Training of pharmacy workers in diarrhoea management [Ross-Degnan et al (1996)[24]]	Urban towns of Nairobi, Nakuru, Kisumu, Kenya; no date Towns of Jakarta and Bogor, Tangerang and Bekasi area, Indonesia; no date	Individual randomized controlled study	Intervention: 2 days in Indonesia and single day in Kenya on knowledge, drug sales and patient communication for diarrhoea management. Face-to-face meetings, 2-3 hour group training. Control: No training	Correct management of diarrhoea
Training of pharmacy workers and drug retailers on management of ARI [Tumwikirize et al (2004)[26]]	Kampala district, Uganda; 2000	Controlled clinical trial	Intervention: Three morning face-to-face sessions, distribution of educational materials. Control: No training	dispensing practices of counter attendants; change in pattern of commonly dispensed drugs

ARI, acute respiratory infections; STI, sexual transmitted infection; STD, sexual transmitted disease

B4.3. Excluded studies

Nineteen studies [27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45] were excluded for reasons given in Table 2 below. The most common reason for exclusion was an in eligible study design.

Table 2: Characteristics of excluded studies

Study	Intervention	Reason for exclusion
Ali et al (2011)[27]	Regulation	This was a cross-sectional study design.
Bhat (1996) [15]	Regulation	This was a cross-sectional study design.
Chakraborty et al (2000)[28]	Training	This was uncontrolled before and after study.
Contiades et al (2007)[29]	Regulation	This was a cross-sectional study design.
Fernandes et al (2009)[30]	Training	This was an RCT in school children providers.
Goodman et al (2005)[30]	Regulation	This was a case study design.
Grundy (2010)[31]	Coordination	This was a case study design.
Guiscafre et al (2001)[32]	Training	This was a cross-sectional study design.
Hongoro et al (2000)[33]	Regulation	This was a cross-sectional study design.
Khan et al (2006)[34]	Training	This was a cross-sectional study design.
Kumaranayake et al (2000)[35]	Regulation	This was a case study design.
Maiga et al (20100[36]	Regulation	This was a cross-sectional design.
Marsh et al (2004)[37]	Training	This was a cross-sectional design.
Murugesan et al (2009)[38]	Training	This was a simple pre and post test intervention.
Nsimba (2007)[39]	Training	This was a cross-sectional design.
Osterholt et al (2009)[41]	Training	This was an interrupted time series with single measure before and two measures after introduction of intervention which does not meet our criteria.
Stenson et al (2001)[42]	Regulation	This was a cross-sectional study. It was a baseline survey of the intervention paper included in our study [25].
Syhakhang et al (2001)[43]	Regulation	It was a cross-sectional study design.
Tavrow et al (2003)[44]	Training	It was a post intervention survey with no controls.

B4.4. Risk of bias in included studies

Our judgements on the risk of bias in each included study are summarised in Fig 2& 3 below.

Figure 2: Risk of bias graph

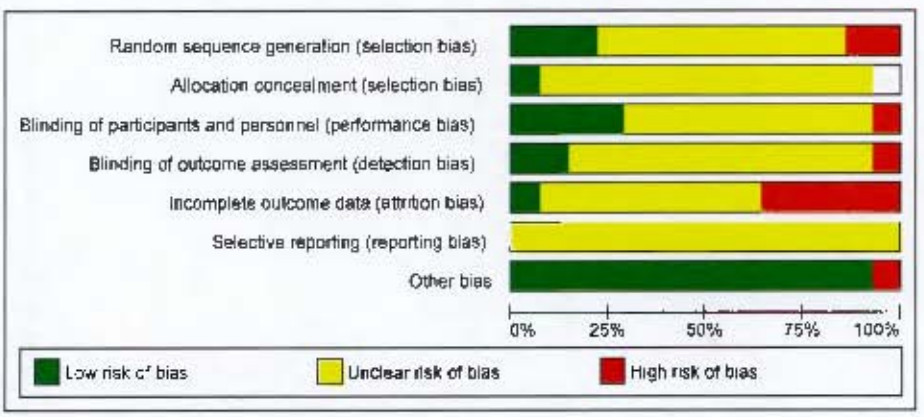
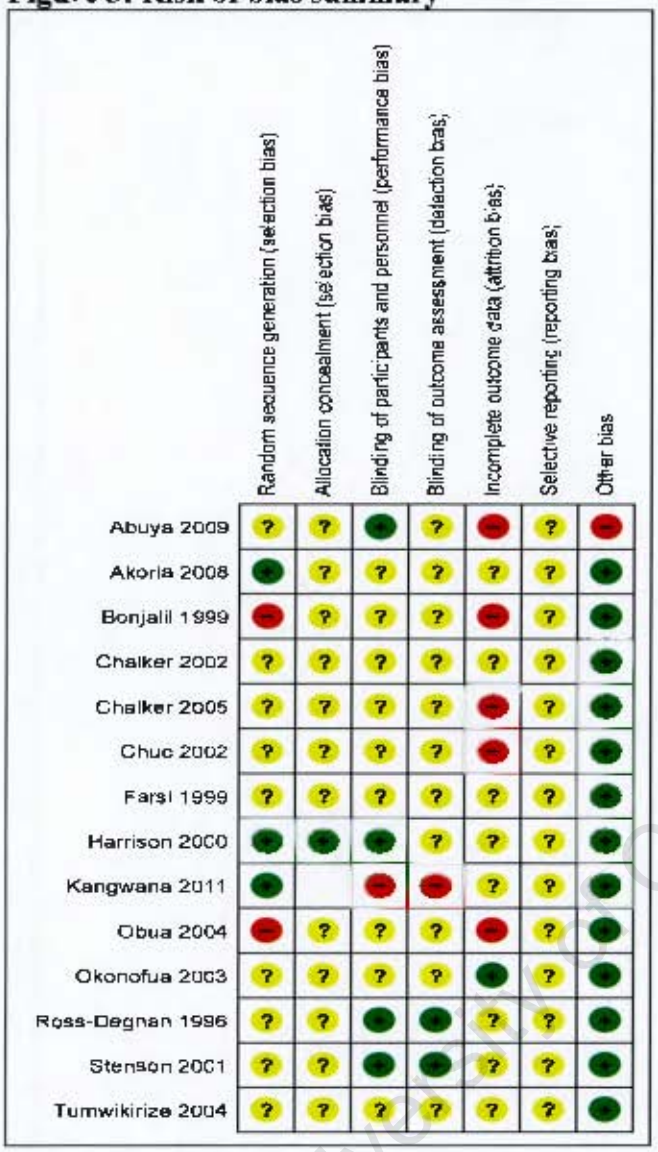


Figure 3: Risk of bias summary



B4.4.1. Sequence generation and allocation concealment (selection bias)

The generation of the randomization sequence was adequate in three studies, [14, 20, 21] inadequate in two [15, 22] and unclear in the remaining nine. [13, 16, 17, 19, 23, 24, 25, 18, 26]. The allocation concealment was adequate in one study [20] and unclear in all the others. [13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26]

B4.4.2. Blinding (performance bias and detection bias)

Outcome assessors were blinded in four studies; [13, 20, 24, 25] blinding was not done in one study, [21] and there was no description of blinding in the rest. [14, 15, 16, 17, 18, 19, 22, 23, 26]

B4.4.3. Incomplete outcome data (attrition bias)

Loss to follow up was minimal in one study [23] and moderate to high in the rest [13,15,17,18,22,14, 16, 19, 20, 21, 24, 25, 26].

B4.4.4. Selective reporting (reporting bias)

Selective reporting was categorized as unclear since the study protocols were not available.

B4.4.5. Other potential sources of bias

In one study (a cluster randomised controlled trial) there was some degree of contamination in a district which was meant to be a control district. We did not have any evidence that other biases were introduced into the remaining studies, over and above the ones reported above.

B4.5. Effects of interventions

Primary outcome

Quality of care

Fourteen studies reported measures of quality of care, such as correct management of diseases. The results were pooled based on intervention and study design.

Training: There were 12 studies on training which were sub-grouped by type of study design. The pooled results show no evidence of an effect for individually randomised controlled trials[14, 16, 17, 19, 23, 24] (6 studies, 2956 participants, RR 0.99, 95% CI 0.70 to 1.39, I^2=96%; figure 4a), controlled clinical trials[26] (1 study, 171 participants, RR 0.89, 95% CI 0.74 to 1.06; figure 4e), and controlled before and after studies (2 studies, 199 participants, RR 1.37, 95% CI 0.81 to 2.33, I^2=0%; figure 4d). [15, 22] However, cluster randomised controlled trials [13, 20, 21] show significant beneficial effects on quality of care among those who received training compared to those were not offered training (3 studies, 1154 participants, RR 3.07, 95% CI 1.55 to 6.08, I^2=91%; figure 4b). In addition, one cluster randomised controlled trial [18] that reported continuous data also shows a beneficial effect of training (1 study, N=4445,

mean difference 0.16 CI 0.10 to 0.21; figure 4c). . Using the Grade approach, [8] we judged the quality of evidence on the effects of training on quality of care as moderate (GRADE summary of findings table available in appendix B.7.1).

Figure 4a: Meta analysis of individual randomised controlled trials of training interventions on quality of care

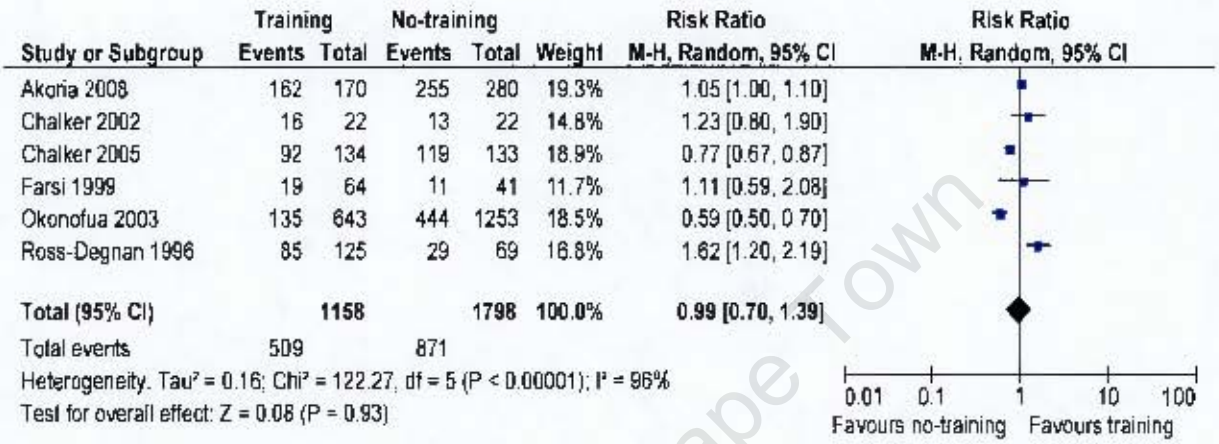


Figure 4b: Meta analysis of cluster randomised controlled trials of training interventions on quality of care.

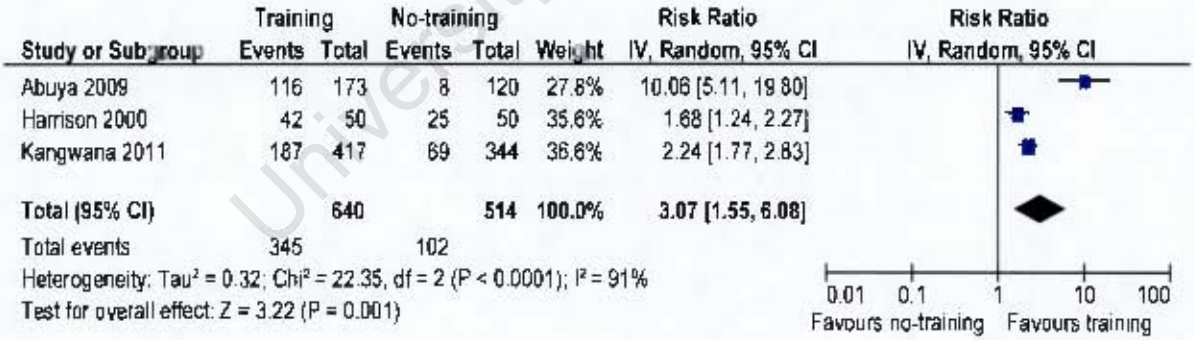


Figure 4c: Meta analysis of continuous cluster randomised controlled trial of training interventions on quality of care.

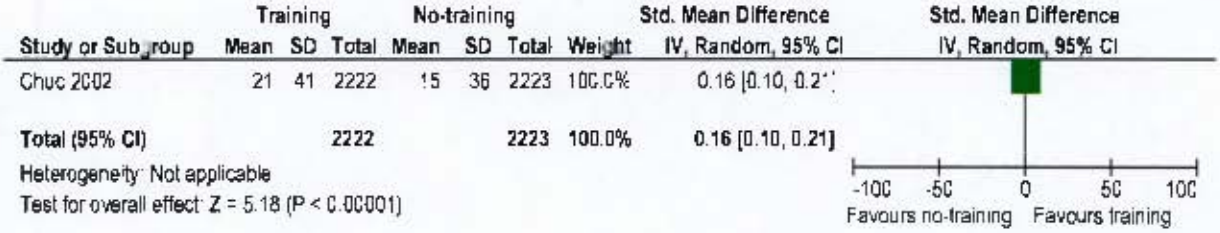
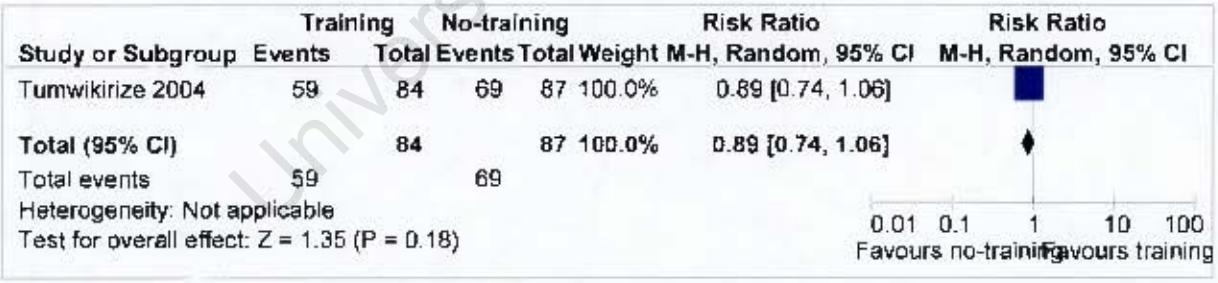


Figure 4d: Meta analysis of controlled before and after studies of training intervention on quality of care.

Figure 4e: Meta analysis of controlled clinical trials of training intervention on quality of care.



Regulation: In four studies, regulation of distribution and selling of registered pharmaceutical products was compared to no intervention. The regulation aimed to protect consumers against unfair practices. The pooled results [16, 17] do not rule out either a beneficial or harmful effect of regulation on quality of care (2 studies, 306 participants, RR 1.05, 95% CI 0.81 to 1.37, I^2=49%; figure 5a). The remaining two studies reported continuous data; one cluster randomised controlled trial[18] shows a small beneficial effect (1 study, N=4445, mean

difference -0.07, CI -0.13 to -0.01; figure 5b) while the individually randomised controlled trial[25] did not find evidence of an effect (1 study, N=92, mean difference 0.07, CI -0.34 to -0.48; figure 5c). We categorised the quality of the evidence on regulatory interventions as low quality (GRADE summary of findings table available in appendix B.7.1).

Figure 5a: Meta analysis of randomised controlled trial of regulation on quality of care.

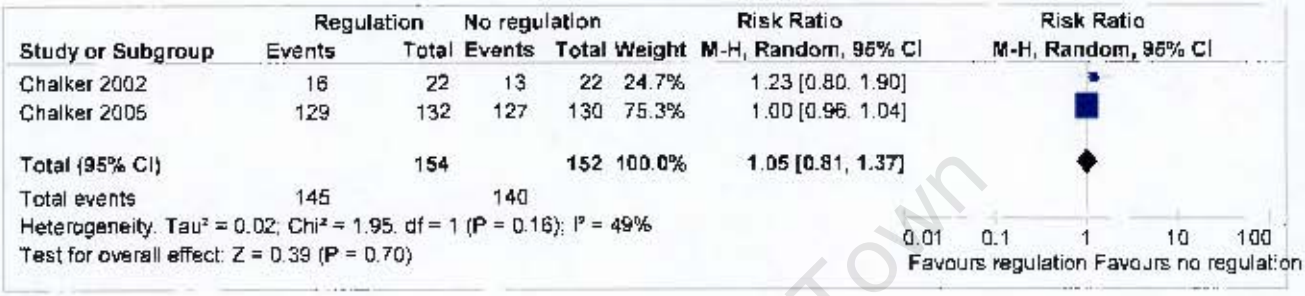


Figure 5b: Meta analysis of continuous cluster randomised controlled trial of Regulation intervention on quality of care.

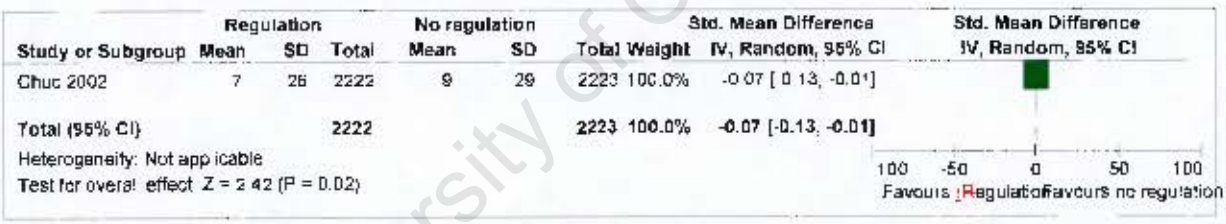
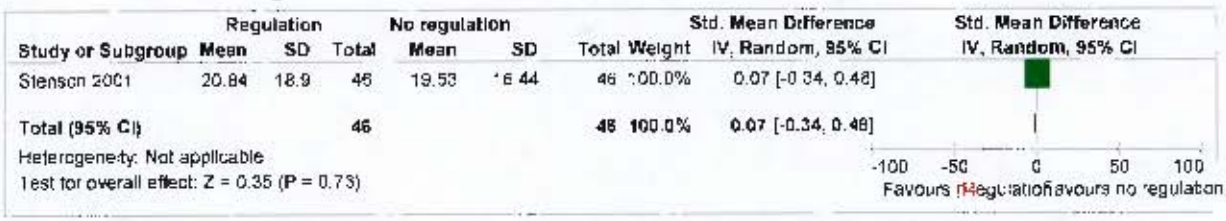


Figure 5c: Meta analysis of continuous randomised controlled trials of regulation on quality of care .



We did not identify a study that assessed coordination of private-for-profit providers.

Secondary outcome

No studies reported on our secondary outcomes i.e. mortality or morbidity, resource use, adverse effects, satisfaction and attitudes.

B.5. Discussion

Summary of main results

We identified 7629 studies from the electronic search, 33 of which were potentially eligible. We excluded 19 of these studies because they were descriptive in nature and did not involve a rigorous evaluation of training, regulation or coordination of private for-profit healthcare providers. The remaining 14 studies met our inclusion criteria. Thirteen studies assessed training, four assessed regulation and none assessed coordination. These studies generally had a high risk of bias. Seven of the 13 studies on training interventions were carried out in Africa and the rest in Asia. These studies evaluated a range of private for-profit services from pharmaceutical practices to prescribing practices. All four studies on regulation were carried out in Asia i.e. Vietnam (2 studies), Thailand, and Lao; and they mostly targeted private for-profit pharmacy practices. The pooled results show that training probably improves the quality of care. However, our findings do not rule out a beneficial or harmful effect of regulation on quality of care. We did not identify an eligible study on coordination of private for profit providers. None of the studies reported data on our secondary outcomes (mortality or morbidity, resource use, adverse effects, satisfaction, or attitudes).

Overall completeness and applicability of evidence

During literature search despite the large number of records obtained, only 14 studies with a high risk of bias met our inclusion criteria. All studies were conducted in the low and middle income countries. It is evident that these interventions have worked successfully in low and middle income countries thus the results are applicable to the context of low- and middle-income countries. Most of the studies covered pharmaceutical and prescribing practices; therefore there is a need for studies on other aspects of private for profit of health care. The absence of data on secondary outcomes such as altitude and satisfaction may suggest that quantitative studies have not adequately evaluated the effects of interventions on these

outcomes. Using the GRADE approach, [8] we judged the quality of evidence on the effects of training on quality of care as moderate, which implies that "further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate". The quality of the evidence on regulatory interventions is considered as low quality evidence which means the "further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate". [8]

Potential biases in the review process

We minimised potential biases in the review process by adhering to the guidelines of the Cochrane Collaboration. [12] We conducted comprehensive searches without limiting the searches to a specific language. Two independent authors assessed study eligibility, extracted data, and assessed the risk of bias in each included study. In addition, we sub-grouped analysis by intervention and study design.

Agreement with other studies or reviews

The findings of our review are consistent with those of two related previous reviews. [4, 6] Both found limited evidence on the effects of public stewardship interventions such as training and regulation. However, to the best of our knowledge, our review is the most comprehensive and up-to-date assessment of the evidence on the effects of training, regulation and coordination of private for-profit health care in low- and middle- income countries. Our review includes six additional studies, [13, 14, 19, 20, 21,22] over and above the ones included in the two previous reviews. [4, 6]

Conclusion

Currently available evidence shows that training probably improves quality of health care in the by private for-profit sector. However, the currently available evidence does not rule out a beneficial or harmful effect of regulation on the quality of care provided by the private for-profit sector. We found no data on the effects of coordination, thus rigorous studies on this

intervention are needed. We recommend that further research on the interventions assessed in this review should be of high quality and should assess other policy-relevant outcomes such as mortality, morbidity, resource use, adverse effects, attitudes, and satisfaction.

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B7. Appendix

B.7.1. GRADE summary of findings table

Training compared to no training for improving quality of care

Patient or population: private for profit providers
Settings: low and middle income countries
Intervention: Training
Comparison: No training

Outcomes	Illustrative comparative risks* (95% CI) Assumed risk / Corresponding risk		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	No training	Training				
Quality of care(cluster RCT) Follow-up: 1-12 months	Low		**RR 3.12** (1.46 to 6.66)	1154 (3 studies)	⊕⊕⊕⊖ **moderate**[1]	
	60 per 1000	187 per 1000 (88 to 400)				
	High					
	500 per 1000	1000 per 1000 (730 to 1000)				
Quality fo care (RCT) Follow-up: 1-12 months	Study population		**RR 0.99** (0.7 to 1.39)	2956 (6 studies)	⊕⊕⊕⊖ **moderate**[1,2]	
	484 per 1000	480 per 1000 (339 to 673)				
	Low					
	270 per 1000	267 per 1000 (189 to 375)				
	High					
	910 per 1000	901 per 1000 (637 to 1000)				
Quality of care(CBA) Follow-up: 3 months	Study population		**RR 1.37** (0.81 to 2.33)	199 (2 studies)	⊕⊕⊖⊖ **low**[2]	
	22 per 100	30 per 100 (18 to 51)				
	Low					
	7 per 100	10 per 100 (6 to 16)				
	High					
	29 per 100	40 per 100 (23 to 68)				
Quality of care(Quasi-RCT) Follow-up: 1 months	Study population		**RR 0.89** (0.79 to 1.06)	171 (1 study)	⊕⊕⊖⊖ **low**[2]	
	79 per 100	71 per 100 (63 to 84)				
	Moderate					
	79 per 100	70 per 100 (62 to 84)				
Quality of care (cluster RCT) Scale from: 0 to 0.16.	The mean quality of care(cluster RCT) in the control groups was **15**	The mean quality of care(cluster RCT) in the intervention groups was **0.16 standard deviations higher** (0.10 to 0.21 higher)		4445 (1 study)	⊕⊕⊕⊖ **moderate**[1]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI)

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] No description of the randomization
[2] The confidence interval is wide

Regulation compared to no regulation for improving quality of care

Patient or population: Private for profit providers
Settings: Vietnam, Lao People Democratic Republic and Thailand.
Intervention: Regulation
Comparison: No regulation

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk **No regulation**	Corresponding risk Regulation				
Quality of care (RCT)	**Study population**		**RR 1.05** (0.81 to 1.37)	306 (2 studies)	⊕⊕⊖⊖ **low**[1,2]	
	92 per 100	**97 per 100** (75 to 100)				
	Low					
	59 per 100	**62 per 100** (48 to 81)				
	High					
	98 per 100	**100 per 100** (79 to 100)				
Quality of care (cluster RCT) Scale from: 0 to 9. Follow-up: 3 months	The mean quality of care (cluster RCT) in the control groups was **9**	The mean quality of care (cluster RCT) in the intervention groups was **0.07 standard deviations lower** (0.13 to 0.01 lower)		2245 (1 study)	⊕⊕⊖⊖ **low**[1,2]	
Quality of care (RCT) Scale from: 0 to 16.	The mean quality of care (RCT) in the control groups was **16.44**	The mean quality of care (RCT) in the intervention groups was **0.07 standard deviations higher** (0.34 lower to 0.48 higher)		92 (1 study)	⊕⊕⊖⊖ **low**[1,2]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR**: Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate

[1] No description of the randomization
[2] regulation measured indirectly for example checking the pharmacy drugs stock

PART C: MANUSCRIPT

Public Stewardship of Private for-Profit Health Care in Low- and Middle-income Countries: A Systematic Review.

Leila H Abdullahi,[1*] Charles Shey Wiysonge[1]

1. Vaccines for Africa Initiative (VACFA), Division of Medical Microbiology, Department of Clinical Laboratory Sciences, University of Cape Town.

*Correspondence: leylaz@live.co.za.

Notes

- For readability, figures and tables are inserted in the text rather than appended at the end of the article.

ABSTRACT

Governments have the responsibility to provide basic health services. However, the public sector does not provide high quality health services accessible to all. This explains why private sector plays a major role but the health care provided is not always of high quality. Therefore, there is a need for public-private sector collaboration in order to increase access to quality services. We assessed the effects of public sector regulation, training, or coordination of health services provided by the private for-profit sector in low and middle-income countries.

Methods: In Jan 2012, we searched the Cochrane Central Register of Controlled, Medline, EMBASE, WHO Library Information System, Web of science, Database of Abstracts of Reviews of Effectiveness, Cochrane Database of Systematic Reviews, and the WHO Clinical Trials Platform .We identified randomised controlled trials (RCTs) and non-randomised control trials (non-RCT) which includes Controlled clinical trials (CCTs), Interrupted time series designs (ITS) and Controlled before-after studies (CBAs) with regulation, training and coordination intervention low and middle income countries. The effects of interventions are compared using risk ratios (RR) or Mean difference, and presented with 95% confidence intervals (CI). The quality of the evidence was assessed using GRADE.

Findings: We identified 7629 studies from the electronic search, 33 of which were potentially eligible. We excluded 19 of these studies because they were descriptive in nature and did not involve a rigorous evaluation of training, regulation, or coordination of private for-profit healthcare providers. The remaining 14 studies met our inclusion criteria: six individual randomised controlled trials, three clusters randomised controlled trials, two controlled before and after studies and one controlled clinical trial. Thirteen studies assessed training, four assessed regulation, and none assessed coordination. These studies generally had a high risk of bias.

Seven of the 13 studies on training were carried out in Africa and the rest in Asia. These studies evaluated a range of private for profit services from pharmaceutical practices to prescribing practices. All the four studies on regulation were carried out in Asia i.e. Vietnam (2 studies), Thailand and Lao. They mostly targeted private for-profit pharmacy practices. The pooled results show no evidence of an effect for individually randomised controlled trials (6 studies, 2956 participants, RR 0.99, 95% CI 0.70 to 1.39, I^2=96%), controlled clinical trials (1 study, 171 participants, RR 0.89, 95% CI 0.74 to 1.06), and controlled before and after studies (2 studies, 199 participants, RR 1.37, 95% CI 0.81 to 2.33, I^2=0%). However, cluster randomised controlled trials show significant beneficial effects on quality of care among those who received training compared to those were not offered training (3 studies, 1154 participants, RR 3.07, 95% CI 1.55 to 6.08, I^2=91%). In addition one cluster randomised controlled trial that reported continuous data also shows a beneficial effect of training (1 study, N=4445, mean difference 0.16 CI 0.10 to 0.21). The pooled results of regulation do not rule out either a beneficial or harmful effect on quality of care (2 studies, 306 participants, RR 1.05, 95% CI 0.81 to 1.37, I^2=49%). The remaining two studies reported continuous data; one cluster randomised controlled trial shows a small beneficial effect (1 study, N=4445, mean difference -0.07, CI -0.13 to -0.01) while the other study, an individual randomised controlled trial did not show any evidence of effect (1 study, N=92, mean difference 0.07, CI -0.34 to -0.48). We did not find an eligible study on coordination. None of the studies reported data on mortality or morbidity, resource use, adverse effects, satisfaction, or attitudes.

Conclusions: Currently available evidence shows that training probably improves quality of health care in the by private for-profit sector. However, the currently available evidence does not rule out a beneficial or harmful effect of regulation on the quality of care provided by the private for-profit sector. We found no data on the effects of coordination, thus rigorous

studies on this intervention are needed. We recommend that further research on the interventions assessed in this review should be of high quality and should assess other policy-relevant outcomes such as mortality, morbidity, resource use, adverse effects, attitudes, and satisfaction.

Funding: **None**

C1. INTRODUCTION

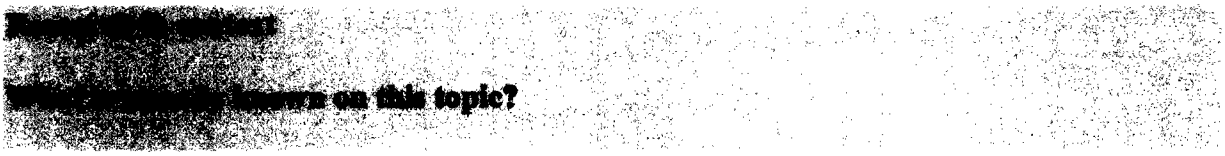
Governments have the responsibility to provide basic services, including health care, to their citizens. However, the public sector is not sufficiently well-equipped and financed to provide high quality health services that are accessible to all. [1] This explains why private healthcare providers play a major role in health service provision in many low and middle-income countries.[2-6] Given the need to work with the private sector to increase access to services, various strategies have been proposed that governments can employ to engage the private sector in service provision.[6] These include regulation, contracting, financing and social marketing, training, and coordination.[1, 6] These interventions are generally applied in combination to reach two important goals: (1) improving the quality of care delivered by existing service providers; and (2) expanding the coverage of private sector services and rationalising this coverage with that of public sector providers. [6] However, there is a paucity of systematic reviews on the effects of these interventions on the quality and accessibility of private for-profit health care in low and middle-income countries.[1, 2, 6] We therefore initiated this review to assess the public stewardship of the private for-profit health sector in low and middle-income countries.

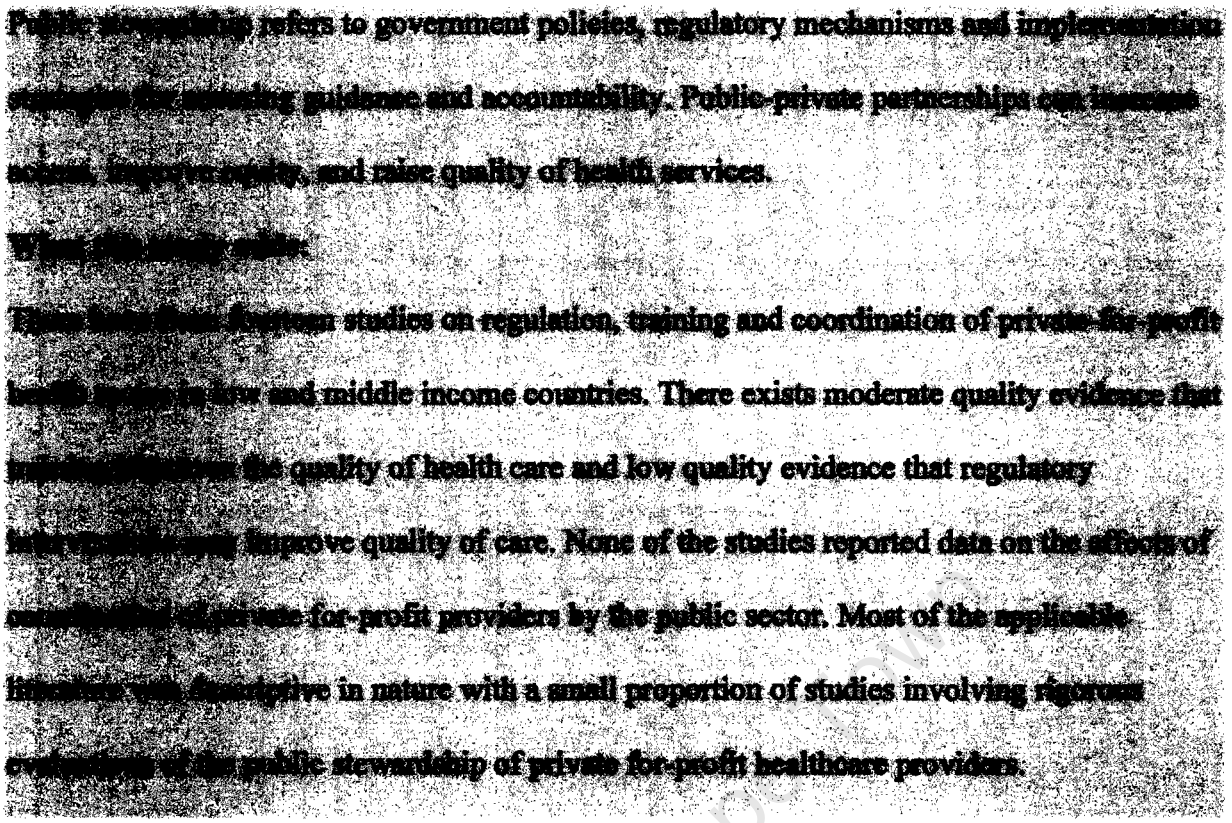
Scarce government resources in low and middle-income countries have led to a decline in the quantity and quality of public health services.[2, 31, 4, 6] These public health failures have led to a drastic increase in private providers of health services, both for-profit and not-for profit, in many low and middle-income countries.[1-6, 10, 31, 32] The consequence of this expansion in the private health sector is that (poor) communities spend outsized amounts of money for private health services; at times when cheaper public sector alternatives are available.[3, 4, 6] However, the suitability and quality of the services provided by the private health sector is increasingly being questioned.[2, 6]

Public stewardship refers to government policies, regulatory mechanisms and implementation strategies for ensuring guidance and accountability.[10] We will focus on three types of strategic interventions, namely, regulation, training, and coordination excluding potential interventions which are already covered by systematic reviews published in the last three years; such as social marketing and franchising, [27] contracting, [29] and pay for performance.[30] Regulation refers to the setting and enforcing of standards for the private sector; training involves educating and supporting private service providers; and coordination entails organising and creating alliances among private and public sector healthcare providers.

A systematic review published in 2007 found "evidence that effective public-private partnerships can increase access, improve equity, and raise quality of health services". [4] However, using the GRADE approach, [8, 9] this evidence on the effectiveness of interventions for working with the private for-profit sector to improve the utilisation and quality of health services for the poor in the low and middle-countries was found to be of low quality.[10] The implication of the low quality of the evidence is that further research on this topic is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate. Therefore there is a great need for current best evidence on interventions for working with private for-profit healthcare providers to improve access and quality of health services.

We did a systematic review to assess the effects of public sector regulation, training, or coordination of health services provided by the private for-profit sector in low and middle-income countries.





C2. METHODS:

C2.1. Search strategy and selection criteria

We included only randomised controlled trials (RCTs) and non-randomised control trials which includes Controlled clinical trials (CCTs), Interrupted time series designs (ITS) and Controlled before-after studies (CBAs). Eligible studies were conducted in low and middle income countries as defined by the World Bank. All types of health services provided by for-profit providers were considered. Eligible interventions were regulation, training, and coordination; of any intensity or duration, implemented by the public sector. The control had to be a no-intervention or alternate-intervention group. Our primary outcome was quality of care (defined as compliance with desired behaviour or guidance). Our secondary outcomes were mortality or morbidity, cost of implementing the interventions, adverse effects, satisfaction, and attitudes to both health providers and patients.

We searched the following electronic databases for primary studies on 10 January 2012: Cochrane Central Register of Controlled (CENTRAL); MEDLINE; EMBASE; WHO Library

Information System; WHO International Clinical Trials Platform; Science Citation Index Expanded; and Social Sciences Citation Index. In addition, on the same date, we searched the Cochrane Database of Systematic Reviews, and the Database of Abstracts of Reviews of Effectiveness for previous relevant reviews. We checked the reference lists of relevant previous reviews [1-6, 28] and full-text articles reviewed for inclusion in this review. We placed no language or date restrictions on the search strategy. The search strategy is included in section C6 Appendix 1. LA screened the titles and abstracts of outputs from the searches using the screening guide to identify studies which met the inclusion criteria and CW verified the selected records. We then retrieved all records deemed potentially eligible by at least one of the two authors, and discard the rest. LA obtained the full text of all potentially eligible articles, and LA and CW independently examined each of these for eligibility. Each of us compiled a list of studies which he/she believed met the inclusion criteria. Both authors compared the list and resolved discrepancies by discussion and consensus.

C2.2. Data collection and analysis

We assessed the risk of bias based on six standard domains: [12] sequence generation, concealment of allocation, blinded or objective assessment of primary outcome(s), incomplete outcome data, selective outcome reporting and other source of bias.

For each included study, we reported our assessment of risk of bias for each domain (i.e. low, high and unclear) together with a descriptive summary of the information that influenced our judgment. The authors compared the results of their independent assessments of risk of bias and resolved any discrepancies by discussion and consensus.

Two authors (LA, CW) independently extracted descriptive and outcome data for each paper using a pre-designed data collection form. Both authors compared the list of included and excluded studies, resolving any discrepancies by discussion and consensus. LA entered the data into the Cochrane Review Manager (RevMan 5.1). [11] CW performed double checks in

RevMan to ensure that there were no errors in the data entered. We grouped measures of treatment effect based on outcome variables. For dichotomous outcomes, results from each trial were expressed as a risk ratio (RR) with 95% confidence intervals. Continuous outcomes were presented in several ways; when absolute values of post-intervention means and standard deviations (SD) were given, using the same rating across studies, we used these to calculate the mean difference (MD) and 95% confidence intervals. If different scales are used to measure the same outcomes, we calculated the standardised mean difference (SMD) with 95% confidence intervals and then combine these in a meta-analysis. We analysed data using Review Manager 5 [11]. We conducted meta-analysis when included randomised trials were similar in terms of participants, interventions, and outcomes. We pooled the data using random-effects method because we detected significant heterogeneity and considered it was clinically meaningful to combine the trials by intervention type and study design. We planned to perform sensitivity analyses to explore the effect of risk of bias on the robustness of our findings. However, this was not possible because all the studies generally had a high risk of bias. In addition, we used the GRADE approach to summarise the quality of the evidence on the effects on each outcome. [9]

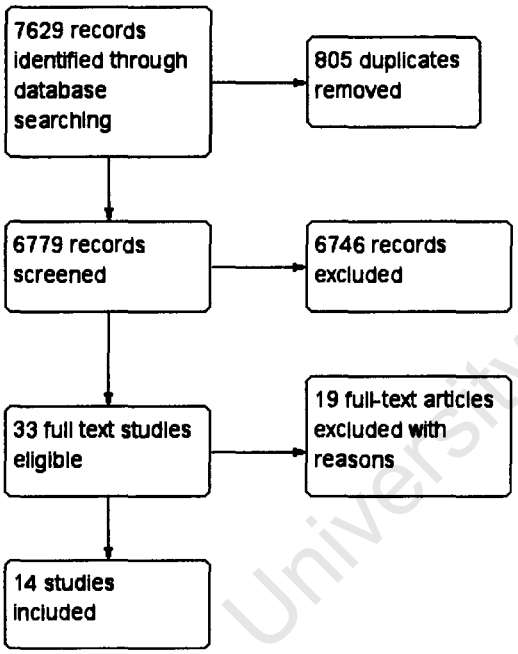
Role of funding source

There was no specific funding source for this study. LA and CW had full access to the data and take responsibility for submission for publication.

C3. Results

We obtained 7,629 titles and abstracts which were all in English language from the electronic search of 8 databases after which we removed 850 duplicates. We screened 6779 records of which 6746 were not relevant, thus we retrieved the full text of 33 potential eligible studies and reviewed for inclusion. Of these, 14 articles met our inclusion criteria [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26] (see Table 1) and the remaining 19 were excluded with reasons as explained later (Table 2). A flow diagram of studies included in the analysis is shown in Figure 1 below.

Figure 1: Study flow diagram



Fourteen studies on regulation and training of private-for-profit in low and middle income countries were included. Eleven were randomised control studies(4 cluster randomised controlled trial and 7 individual randomised controlled trial, [13, 14, 16, 17, 18, 19, 20, 21, 23, 24, 25] two controlled before and after studies, [15, 22] and one controlled clinical trial.[26] Thirteen studies had interventions that concerned training; [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26] four studies assessed regulation [16, 17, 18, 25] and no studies evaluated coordination.

Table 1: Characteristics of included studies

Intervention evaluated	Location and date	Study design	Description of intervention	Outcome measures
Regulation.				
Regulation of pharmacy practice [Stenson et al (2001) [25]	Savannakhet province, Lao P.D.R; 1988	Individual randomized controlled study	Intervention: Intensive supervision of quality of services of private pharmacies Control: regular service	Change of the quality of private pharmacy practice(pharmacy indicators)
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2002)[16]]	Hanoi; Vietnam; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring. Control: No intervention	Change in practice for correct management of tracer conditions
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2005) [17]]	Hanoi: Vietnam, and Bankok,Thailand; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring in two countries. Control: No intervention	Change in the dispensing practices of antibiotics in Hanoi and Bangkok.
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chuc et al (2002) [18]]	Hanoi,Vietnam: 1997	A clustered randomized controlled trial	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement and peer monitoring. Control: No intervention	Correct symptomatic treatment of sexually transmitted disease (STD)
Training				
Training of drug outlet sellers.[Abuya et al (2009) [13]]	Kwale, Makueni and Busia in Kenya; 2002	Cluster randomized trial.	Intervention: A 2 day workshop of trainingon malaria.Surrogate clients were used to pose as patients and retail audits were used to collect information on the outlets and retailers. Control: No training	Retailers' knowledge on the treatment of childhood malaria
Training on prescription writing on doctors [Akoria et al (2008)[14]]	Benin City, Southern Nigeria; 2000	Individual randomized control trial	Intervention: 20-30 min workshop face to face and seminar on prescription writing. Control: No education	Improving prescription writing among doctors in private sectors with doses of medicines prescribed as an example.

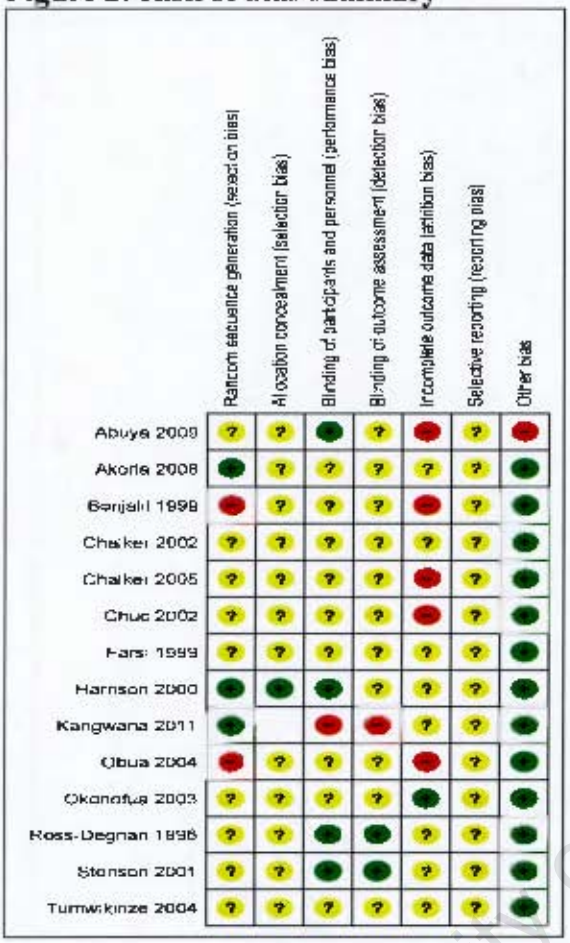
Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2002) [16]]	Hanoi, Vietnam; 1998	Individual randomized controlled study	Intervention; Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring Control: No intervention.	Correct management of tracer conditions
Training of pharmacy workers in management of conditions and dispensing practices [Chalker et al (2005) [17]]	Hanoi, Vietnam, and Bankok,Thailand; 1998	Individual randomized controlled study	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement, peer monitoring in two countries. Control: No intervention.	Change in the dispensing practices of antibiotics
Training of private doctors on management of ARI and diarrhoea in children [Bonjalil et al (1999)[15]]	Tlaxcala State, Mexico; 1993	Controlled before and after study	Intervention: In-service training through 5-day course on diarrhoea and ARI Control: No intervention	Correct management of diarrhoea / ARI;
Regulation and Training of pharmacy workers in management of conditions and dispensing practices [Chuc et al (2002)[18]]	Hanoi, Vietnam; 1997	A clustered randomized controlled trial with a time series design	Intervention: Multi-component intervention including training on dispensing practices for ARI, STI, steroids and antibiotic drugs, through two 45-minute face-to-face training sessions, regulation enforcement and peer monitoring. Control: No intervention	Correct symptomatic treatment of sexually transmitted diseases
Training of private dentist on use of sealants[Farsi (1999)[19]]	Jeddah,Kingdom of Saudia; no date	Individual randomized control trial	Intervention: Training on use of sealants. Control: No training	Change in use of sealants.
Training of both health worker and adolescent on STI [Harrison et al (2000)[20]]	KwaZulu/Natal, South Africa; 1996	Cluster-randomized design	Intervention: Training and supervision of health workers in a comprehensive approach to STD syndromic case management. Control: No training	Correct syndromic drug treatment
Retail training of drug outlets workers.[Kagwana et al (2011) [21]]	Butere-Mumias, Teso and Busia in Kenya; 2008	Cluster randomised controlled design	Intervention: A one-day malaria-related training was attended by outlet staff. Control: No training	Correct management of childhood malaria

Training of physicians.[Obua et al (2004)[22]]	Masaka,Jinja and Kampala in Uganda; no date.	Comparison group design	Intervention: One day educational workshop on guidelines and treatment of common conditions. pre-university school leavers aged 19-22 years were recruited and trained to simulate the symptoms and signs. Control: No training	Effect of intervention on treatment of ARI .
Training of private doctors, pharmacy workers and patent medicine vendors on STI management [Okonofua et al (2003)[23]]	Western section of Benin City, Edo State, Nigeria; 1997	Individual randomized control trial	Intervention: Training on STI diagnosis and treatment, including 30 hours of lectures, demonstrations, practical exercises. Control: No training	Correct management of sexually transmitted diseases
Training of pharmacy workers in diarrhoea management [Ross-Degnan et al (1996)[24]]	Urban towns of Nairobi, Nakuru, Kisumu, Kenya; no date Towns of Jakarta and Bogor, Tangerang and Bekasi area, Indonesia; no date	Individual randomized controlled study	Intervention: 2 days in Indonesia and single day in Kenya on knowledge, drug sales and patient communication for diarrhoea management. Face-to-face meetings, 2-3 hour group training. Control: No training	Correct management of diarrhoea
Training of pharmacy workers and drug retailers on management of ARI [Tumwikirize et al (2004)[26]]	Kampala district, Uganda; 2000	Controlled clinical trials	Intervention: Three morning face-to-face sessions, distribution of educational materials. Control: No training	dispensing practices of counter attendants; change in pattern of commonly dispensed drugs

ARI, acute respiratory infections; STI, sexual transmitted infection; STD, sexual transmitted disease

Our judgements on the risk of bias in each included study are summarised in Fig.2 below.

Figure 2: Risk of bias summary



The generation of the randomization sequence was adequate in three studies, [14, 20, 21] inadequate in two [15, 22] and unclear risk in the remaining nine. [13, 16, 17, 19, 23, 24, 25, 18, 26]. The allocation concealment was adequate in one study [20] and unclear in all the others. [13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26] Outcome assessors were blinded in four studies; [13, 20, 24, 25] blinding was not done in one study [21] and there was no description of blinding in the rest. [14, 15, 16, 17, 18, 19, 22, 23, 26] Loss to follow up was minimal in one study [23] and moderate to high in the rest [13,15,17,18,22, 14, 16, 19, 20, 21, 24, 25, 26]. Selective reporting was categorized as unclear since the study protocols were not available. In one study (a cluster randomised controlled trial) there was some degree of contamination in a district which was meant to be a control district. We did

not have any evidence that other biases were introduced into the remaining studies, over and above the ones reported above.

Fourteen studies reported measures of quality of care, such as correct management of diseases. The results were pooled based on intervention and study design. Training: There were 12 studies on training which were sub-grouped by type of study design. The pooled results show no evidence of an effect for individually randomised controlled trials[14, 16, 17, 19, 23, 24] (6 studies, 2956 participants, RR 0.99, 95% CI 0.70 to 1.39, I^2=96%; figure 3a), controlled clinical trials[26] (1 study, 171 participants, RR 0.89, 95% CI 0.74 to 1.06; figure 3e), and controlled before and after studies (2 studies, 199 participants, RR 1.37, 95% CI 0.81 to 2.33, I^2=0%; figure 3d).[15, 22] However, cluster randomised controlled trials [13, 20, 21] show significant beneficial effects on quality of care among those who received training compared to those were not offered training (3 studies, 1154 participants, RR 3.07, 95% CI 1.55 to 6.08, I^2=91%; figure 3b). In addition, one cluster randomised controlled trial [18] that reported continuous data also shows a beneficial effect of training (1 study, N=4445, mean difference 0.16 CI 0.10 to 0.21; figure 3c). Using the Grade approach, [8] we judged the quality of evidence on the effects of training on quality of care as moderate (GRADE summary of findings table available in appendix C.6.2).

Figure 3a: Meta analysis of individual randomised controlled trial of training interventions on quality of care.

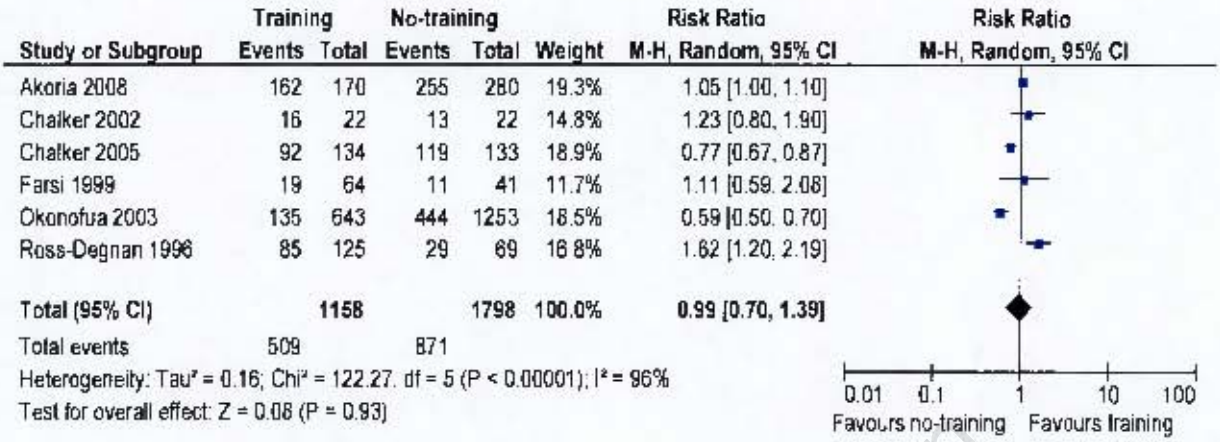


Figure 3b: Meta analysis of cluster randomised controlled trial of training interventions on quality of care.

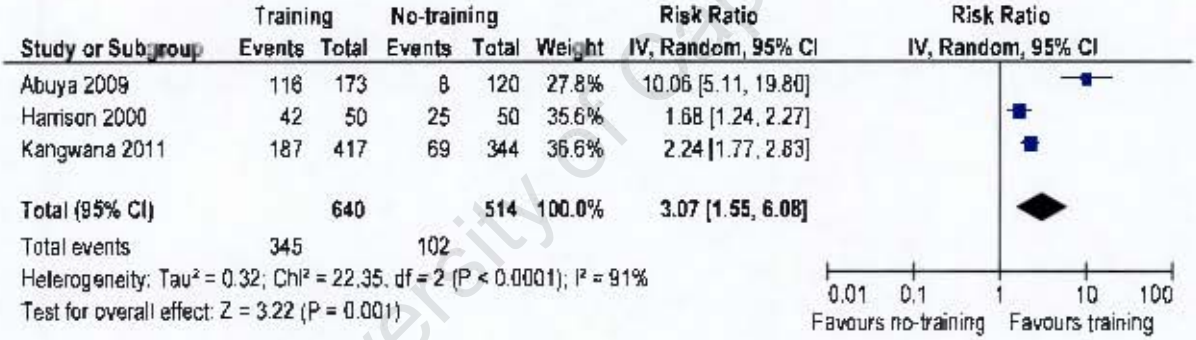


Figure 3c: Meta analysis of continuous cluster randomised controlled trial of training interventions on quality of care.

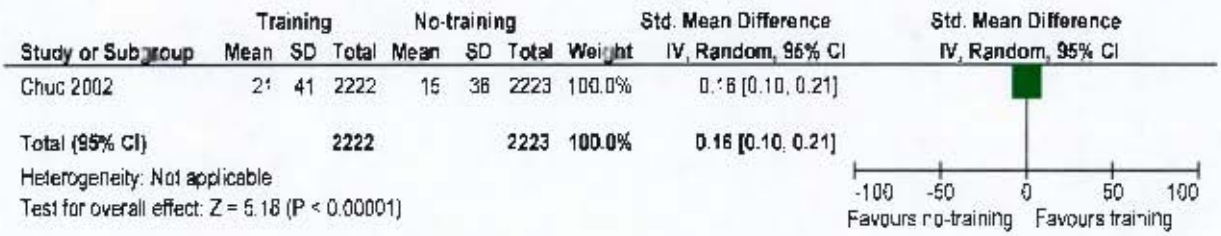


Figure 3d: Meta analysis of controlled before and after of training intervention on quality of care.

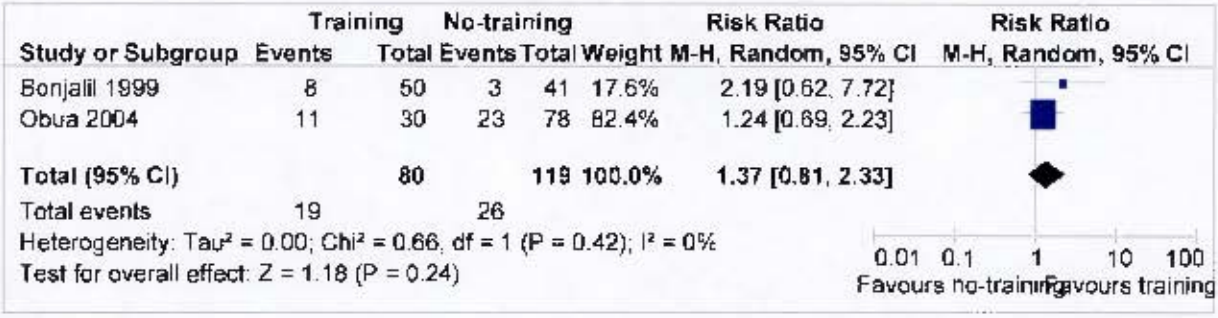
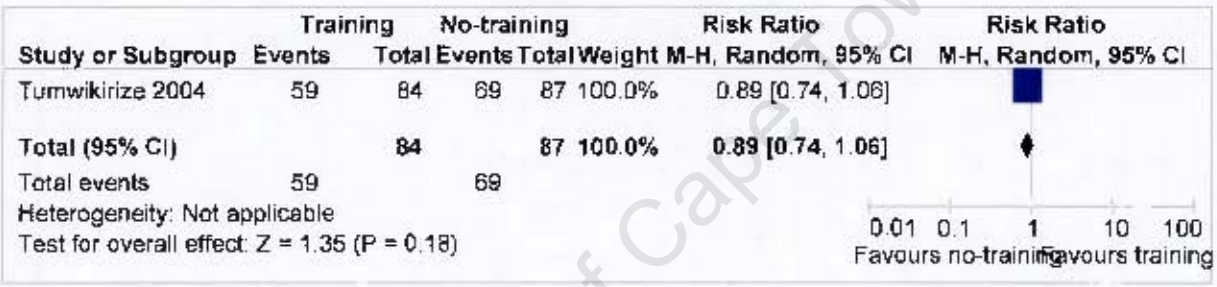


Figure 3e: Meta analysis of controlled clinical trials of training intervention on quality of care.



Regulation: In four studies, regulation of distribution and selling of registered pharmaceutical products was compared to no intervention. The regulation aimed to protect consumers against unfair practices. The pooled results [16, 17] do not rule out either a beneficial or harmful effect of regulation on quality of care (2 studies, 306 participants, RR 1.05, 95% CI 0.81 to 1.37, I^2=49%; figure 4a). The remaining two studies reported continuous data; one cluster randomised controlled trial[18] shows a small beneficial effect (1 study, N=4445, mean difference -0.07, CI -0.13 to -0.01; figure 4b) while the individually randomised controlled trial[25] did not find evidence of an effect (1 study, N=92, mean difference 0.07, CI -0.34 to -0.48; figure 4c). We categorised the quality of the evidence on regulatory interventions as low quality (GRADE summary of findings table available in appendix C.6.2).

Figure 3a: Meta analysis of randomised controlled trial of Regulation intervention on quality of care.

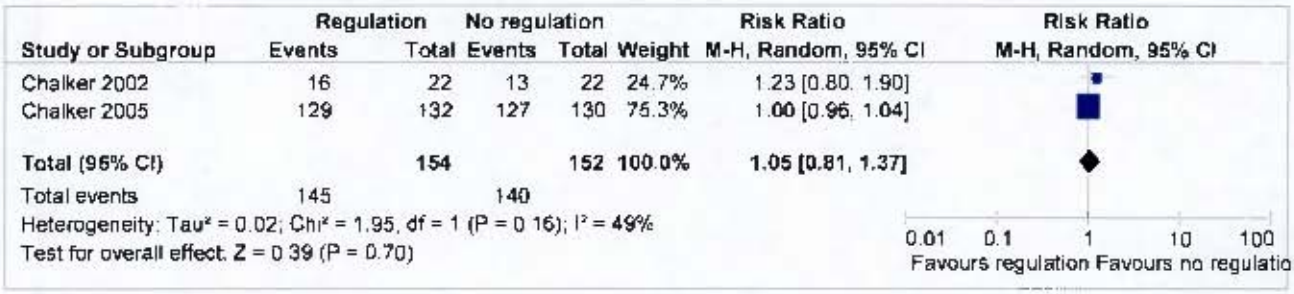


Figure 3b: Meta analysis of continuous cluster randomised controlled trial of Regulation intervention on quality of care.

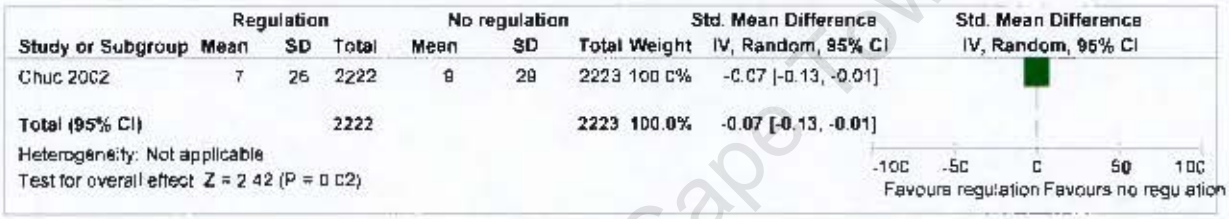
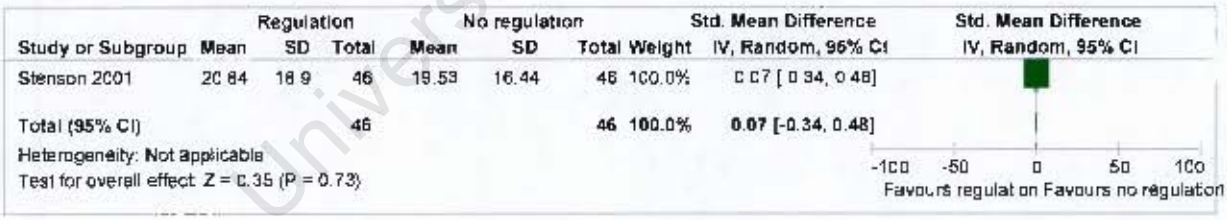


Figure 3c: Meta analysis of continuous randomised controlled trial of Regulation intervention on quality of care.



No studies reported on our secondary outcomes i.e. mortality or morbidity, resource use, adverse effects, satisfaction and attitudes.

C4. Discussion

We identified 7629 studies from the electronic search, 33 of which were potentially eligible. We excluded 19 of these studies because they were descriptive in nature and did not involve a rigorous evaluation of training, regulation or coordination of private for-profit healthcare providers. The remaining 14 studies met our inclusion criteria. Thirteen studies assessed training, four assessed regulation and none assessed coordination. These studies generally had a high risk of bias. Seven of the 13 studies on training interventions were carried out in Africa and the rest in Asia. These studies evaluated a range of private for-profit services from pharmaceutical practices to prescribing practices. All four studies on regulation were carried out in Asia i.e. Vietnam (2 studies), Thailand, and Lao; and they mostly targeted private for-profit pharmacy practices. The pooled results show that training probably improves the quality of care. However, our findings do not rule out a beneficial or harmful effect of regulation on quality of care. We did not identify an eligible study on coordination of private for profit providers. None of the studies reported data on our secondary outcomes (mortality or morbidity, resource use, adverse effects, satisfaction, or attitudes).

During literature search despite the large number of records obtained, only 14 studies with a high risk of bias met our inclusion criteria. All studies were conducted in the low and middle income countries. It is evident that these interventions have worked successfully in low and middle income countries thus the results are applicable to the context of low- and middle-income countries. Most of the studies covered pharmaceutical and prescribing practices; therefore there is a need for studies on other aspects of private for profit of health care. The absence of data on secondary outcomes such as altitude and satisfaction may suggest that quantitative studies have not adequately evaluated the effects of interventions on these outcomes. Using the GRADE approach, [8] we judged the quality of evidence on the effects of training on quality of care as moderate, which implies that "further research is likely to have

an important impact on our confidence in the estimate of effect and may change the estimate". The quality of the evidence on regulatory interventions is considered as low quality evidence which means the "further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate". [8]

We minimised potential biases in the review process by adhering to the guidelines of the Cochrane Collaboration. [12] We conducted comprehensive searches without limiting the searches to a specific language. Two independent authors assessed study eligibility, extracted data, and assessed the risk of bias in each included study. In addition, we sub-grouped analysis by intervention and study design.

The findings of our review are consistent with those of two related previous reviews. [4, 6] Both found limited evidence on the effects of public stewardship interventions such as training and regulation. However, to the best of our knowledge, our review is the most comprehensive and up-to-date assessment of the evidence on the effects of training, regulation and coordination of private for-profit health care in low- and middle- income countries. Our review includes six additional studies, [13, 14, 19, 20, 21,22] over and above the ones included in the two previous reviews. [4, 6]

Currently available evidence shows that training probably improves quality of health care in the by private for-profit sector. However, the currently available evidence does not rule out a beneficial or harmful effect of regulation on the quality of care provided by the private for-profit sector. We found no data on the effects of coordination, thus rigorous studies on this intervention are needed. We recommend that further research on the interventions assessed in this review should be of high quality and should assess other policy-relevant outcomes such as mortality, morbidity, resource use, adverse effects, attitudes, and satisfaction.

Contributors

LA coordinated the study under the supervision of CW. LA wrote the protocol, ran the searches, selected studies, extracted, conducted the analysis, and wrote the first draft of the manuscript. CW supervised all these stages of the study and manuscript writing.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgement

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We are grateful to Marit Johansen of the Cochrane Collaboration Effective Practice and Organization of Care Group (EPOC) who assisted us in developing the electronic search strategy and conducting the searches.

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C6. Appendices

C6.1. Search strategy

1. **CENTRAL (Cochrane Library)**

#	Searches
#1	MeSH descriptor Public-Private Sector Partnerships, this term only
#2	MeSH descriptor Private Sector, this term only
#3	MeSH descriptor Private Practice, this term only
#4	MeSH descriptor Hospitals, Private, this term only
#5	MeSH descriptor Privatization, this term only
#6	privat*:ti,ab
#7	MeSH descriptor Public Sector, this term only
#8	MeSH descriptor Public Policy, this term only
#9	MeSH descriptor Health Policy, this term only
#10	MeSH descriptor State Dentistry, this term only
#11	MeSH descriptor Health Care Reform, this term only
#12	MeSH descriptor Health Planning, this term only
#13	MeSH descriptor Social Control, Formal, this term only
#14	MeSH descriptor Law Enforcement, this term only
#15	MeSH descriptor Government explode all trees
#16	MeSH descriptor Government Regulation, this term only
#17	MeSH descriptor Facility Regulation and Control, this term only
#18	MeSH descriptor Policy Making, this term only
#19	MeSH descriptor Jurisprudence, this term only
#20	MeSH descriptor Mandatory Reporting, this term only
#21	MeSH descriptor Politics, this term only
#22	MeSH descriptor Legislation as Topic, this term only
#23	MeSH descriptor Legislation, Hospital, this term only
#24	MeSH descriptor Legislation, Medical, this term only
#25	MeSH descriptor Legislation, Nursing, this term only
#26	MeSH descriptor Legislation, Pharmacy, this term only
#27	MeSH descriptor Legislation, Drug, this term only
#28	MeSH descriptor Legislation, Dental, this term only
#29	(public* or stewardship* or governance or governing or coordinat* or co NEXT ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*):ti,ab
#30	MeSH descriptor Physician's Practice Patterns, this term only
#31	MeSH descriptor Nurse's Practice Patterns, this term only
#32	MeSH descriptor Dentist's Practice Patterns, this term only
#33	MeSH descriptor Health Knowledge, Attitudes, Practice, this term only

#34 MeSH descriptor Malpractice, this term only
#35 MeSH descriptor Professional Impairment, this term only
#36 MeSH descriptor Physician Impairment, this term only
#37 MeSH descriptor Medical Errors, this term only
#38 MeSH descriptor Diagnostic Errors, this term only
#39 MeSH descriptor Medication Errors explode all trees
#40 MeSH descriptor Professional Competence, this term only
#41 MeSH descriptor Clinical Competence, this term only
#42 (competence or practice NEXT pattern* or malpractice or mal NEXT practice or error*):ti,ab
#43 MeSH descriptor Education, this term only
#44 MeSH descriptor Competency-Based Education, this term only
#45 MeSH descriptor Education, Public Health Professional, this term only
#46 MeSH descriptor Education, Medical, this term only
#47 MeSH descriptor Education, Medical, Continuing, this term only
#48 MeSH descriptor Education, Nursing, this term only
#49 MeSH descriptor Education, Nursing, Continuing, this term only
#50 MeSH descriptor Education, Dental, this term only
#51 MeSH descriptor Education, Dental, Continuing, this term only
#52 MeSH descriptor Education, Pharmacy, this term only
#53 MeSH descriptor Education, Pharmacy, Continuing, this term only
#54 (educat* or train or training or trained or colloquium* or conference* or course* or lecture* or meeting* or seminar* or support* or symposi* or workshop*):ti,ab
#55 MeSH descriptor Delivery of Health Care, this term only
#56 MeSH descriptor Quality of Health Care, this term only
#57 MeSH descriptor Quality Assurance, Health Care, this term only
#58 MeSH descriptor Quality Improvement, this term only
#59 MeSH descriptor Total Quality Management, this term only
#60 MeSH descriptor Outcome and Process Assessment (Health Care), this term only
#61 MeSH descriptor Outcome Assessment (Health Care), this term only
#62 MeSH descriptor Process Assessment (Health Care), this term only
#63 MeSH descriptor Guideline Adherence, this term only
#64 MeSH descriptor Benchmarking, this term only
#65 MeSH descriptor Standard of Care, this term only
#66 MeSH descriptor Reference Standards, this term only
#67 (best NEXT practice or quality or standard* or benchmark* or adherence or requirement*):ti,ab
#68 (Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"):ti,ab,kw
#69 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or

Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or "Upper Volta" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or Chile or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Croatia or Cuba or Cyprus or Czechoslovakia or "Czech Republic" or Slovakia or "Slovak Republic"):ti,ab,kw

#70 (Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "United Arab Republic" or "El Salvador" or Eritrea or Estonia or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or Georgia or Georgian or Ghana or "Gold Coast" or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania):ti,ab,kw

#71 (Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or "Marshall Islands" or Mauritania or Mauritius or "Agalega Islands" or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or "Netherlands Antilles" or "New Caledonia" or Nicaragua or Niger or Nigeria or "Northern Mariana Islands" or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or "Puerto Rico"):ti,ab,kw

#72 (Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Kitts" or "St Kitts" or Nevis or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or "Saudi Arabia" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or Slovenia or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or "New Hebrides" or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia):ti,ab,kw

#73 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income or underserved or "under served" or deprived or poor*) NEXT (countr* or nation* or population* or world):ti,ab,kw

#74 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income) NEXT (economy or economies):ti,ab,kw

#75 low* NEXT (gdp or gnp or "gross domestic" or "gross national"):ti,ab,kw

#76 (low NEAR/3 middle NEAR/3 countr*):ti,ab,kw

#77 (lmic or lmics or "third world" or "lami country" or "lami countries"):ti,ab,kw

#78 ("transitional country" or "transitional countries"):ti,ab,kw

#79 (#2 OR #3 OR #4 OR #5 OR #6)

#80 (#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67)

#81 (#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78)

#82 (#1 AND #81)

#83 (#79 AND #80 AND #81)

#84 (#82 OR #83)

2. **DARE (Cochrane Library)**

#	**Searches**
#1	MeSH descriptor Public-Private Sector Partnerships, this term only
#2	MeSH descriptor Private Sector, this term only
#3	MeSH descriptor Private Practice, this term only
#4	MeSH descriptor Hospitals, Private, this term only
#5	MeSH descriptor Privatization, this term only
#6	privat*:ti,ab
#7	MeSH descriptor Public Sector, this term only
#8	MeSH descriptor Public Policy, this term only
#9	MeSH descriptor Health Policy, this term only
#10	MeSH descriptor State Dentistry, this term only
#11	MeSH descriptor Health Care Reform, this term only
#12	MeSH descriptor Health Planning, this term only
#13	MeSH descriptor Social Control, Formal, this term only
#14	MeSH descriptor Law Enforcement, this term only
#15	MeSH descriptor Government explode all trees
#16	MeSH descriptor Government Regulation, this term only
#17	MeSH descriptor Facility Regulation and Control, this term only
#18	MeSH descriptor Policy Making, this term only
#19	MeSH descriptor Jurisprudence, this term only
#20	MeSH descriptor Mandatory Reporting, this term only
#21	MeSH descriptor Politics, this term only
#22	MeSH descriptor Legislation as Topic, this term only
#23	MeSH descriptor Legislation, Hospital, this term only
#24	MeSH descriptor Legislation, Medical, this term only
#25	MeSH descriptor Legislation, Nursing, this term only
#26	MeSH descriptor Legislation, Pharmacy, this term only
#27	MeSH descriptor Legislation, Drug, this term only

#28 MeSH descriptor Legislation, Dental, this term only

#29 (public* or stewardship* or governance or governing or coordinat* or co NEXT ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*):ti,ab

#30 MeSH descriptor Physician's Practice Patterns, this term only

#31 MeSH descriptor Nurse's Practice Patterns, this term only

#32 MeSH descriptor Dentist's Practice Patterns, this term only

#33 MeSH descriptor Health Knowledge, Attitudes, Practice, this term only

#34 MeSH descriptor Malpractice, this term only

#35 MeSH descriptor Professional Impairment, this term only

#36 MeSH descriptor Physician Impairment, this term only

#37 MeSH descriptor Medical Errors, this term only

#38 MeSH descriptor Diagnostic Errors, this term only

#39 MeSH descriptor Medication Errors explode all trees

#40 MeSH descriptor Professional Competence, this term only

#41 MeSH descriptor Clinical Competence, this term only

#42 (competence or practice NEXT pattern* or malpractice or mal NEXT practice or error*):ti,ab

#43 MeSH descriptor Education, this term only

#44 MeSH descriptor Competency-Based Education, this term only

#45 MeSH descriptor Education, Public Health Professional, this term only

#46 MeSH descriptor Education, Medical, this term only

#47 MeSH descriptor Education, Medical, Continuing, this term only

#48 MeSH descriptor Education, Nursing, this term only

#49 MeSH descriptor Education, Nursing, Continuing, this term only

#50 MeSH descriptor Education, Dental, this term only

#51 MeSH descriptor Education, Dental, Continuing, this term only

#52 MeSH descriptor Education, Pharmacy, this term only

#53 MeSH descriptor Education, Pharmacy, Continuing, this term only

#54 (educat* or train or training or trained or colloquium* or conference* or course* or lecture* or meeting* or seminar* or support* or symposi* or workshop*):ti,ab

#55 MeSH descriptor Delivery of Health Care, this term only

#56 MeSH descriptor Quality of Health Care, this term only

#57 MeSH descriptor Quality Assurance, Health Care, this term only

#58 MeSH descriptor Quality Improvement, this term only

#59 MeSH descriptor Total Quality Management, this term only

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#61 MeSH descriptor Outcome Assessment (Health Care), this term only

#62 MeSH descriptor Process Assessment (Health Care), this term only

#63 MeSH descriptor Guideline Adherence, this term only

#64 MeSH descriptor Benchmarking, this term only

#65 MeSH descriptor Standard of Care, this term only

#66 MeSH descriptor Reference Standards, this term only

#67 (best NEXT practice or quality or standard* or benchmark* or adherence or requirement*):ti,ab

#68 (Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"):ti,ab,kw

#69 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or "Upper Volta" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or Chile or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Croatia or Cuba or Cyprus or Czechoslovakia or "Czech Republic" or Slovakia or "Slovak Republic"):ti,ab,kw

#70 (Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "United Arab Republic" or "El Salvador" or Eritrea or Estonia or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or Georgia or Georgian or Ghana or "Gold Coast" or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania):ti,ab,kw

#71 (Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or "Marshall Islands" or Mauritania or Mauritius or "Agalega Islands" or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or "Netherlands Antilles" or "New Caledonia" or Nicaragua or Niger or Nigeria or "Northern Mariana Islands" or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or "Puerto Rico"):ti,ab,kw

#72 (Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Kitts" or "St Kitts" or Nevis or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or "Saudi Arabia" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or Slovenia or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or "New Hebrides" or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia):ti,ab,kw

#73 (developing or less* NEXT developed or "under developed" or underdeveloped or

"middle income" or low* NEXT income or underserved or "under served" or deprived or poor*) NEXT (countr* or nation* or population* or world):ti,ab,kw

#74 (developing or less* NEXT developed or "under developed" or underdeveloped or "middle income" or low* NEXT income) NEXT (economy or economies):ti,ab,kw

#75 low* NEXT (gdp or gnp or "gross domestic" or "gross national"):ti,ab,kw

#76 (low NEAR/3 middle NEAR/3 countr*):ti,ab,kw

#77 (lmic or lmics or "third world" or "lami country" or "lami countries"):ti,ab,kw

#78 ("transitional country" or "transitional countries"):ti,ab,kw

#79 (#2 OR #3 OR #4 OR #5 OR #6)

#80 (#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67)

#81 (#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78)

#82 (#1 AND #81)

#83 (#79 AND #80 AND #81)

#84 (#82 OR #83)

3. **MEDLINE In-Process & Other Non-Indexed Citations** and **MEDLINE** (Ovid)

#	**Searches**
1	Public-Private Sector Partnerships/
2	Private Sector/
3	Private Practice/
4	Hospitals, Private/
5	Privatization/
6	privat*.ti,ab.
7	or/2-6
8	Public Sector/
9	Public Policy/
10	Health Policy/
11	State Medicine/
12	State Dentistry/
13	Health Care Reform/
14	Health Planning/
15	Social Control, Formal/
16	Law Enforcement/
17	exp Government/
18	Government Regulation/
19	"Facility Regulation and Control"/

20 Policy Making/
21 Jurisprudence/
22 Mandatory Reporting/
23 Politics/
24 Legislation as Topic/
25 Legislation, Hospital/
26 Legislation, Medical/
27 Legislation, Nursing/
28 Legislation, Pharmacy/
29 Legislation, Drug/
30 Legislation, Dental/
31 (public* or stewardship* or governance or governing or coordinat* or co ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*).ti,ab.
32 or/8-31
33 Physician's Practice Patterns/
34 Nurse's Practice Patterns/
35 Dentist's Practice Patterns/
36 Health Knowledge, Attitudes, Practice/
37 Malpractice/
38 Professional Impairment/
39 Physician Impairment/
40 Medical Errors/
41 Diagnostic Errors/
42 Medication Errors/
43 Professional Competence/
44 Clinical Competence/
45 (competence or practice pattern* or malpractice or mal practice or error*).ti,ab.
46 or/33-45
47 Education/
48 Competency-Based Education/
49 Education, Public Health Professional/
50 Education, Medical/
51 Education, Medical, Continuing/
52 Education, Nursing/
53 Education, Nursing, Continuing/
54 Education, Dental/
55 Education, Dental, Continuing/
56 Education, Pharmacy/
57 Education, Pharmacy, Continuing/
58 (educat* or train or training or trained or colloquium? or conference? or course? or

lecture? or meeting? or seminar? or support* or symposi* or workshop?).ti,ab.

59 or/47-58

60 "Delivery of Health Care"/

61 "Quality of Health Care"/

62 Quality Assurance, Health Care/

63 Quality Improvement/

64 Total Quality Management/

65 "Outcome and Process Assessment (health care)"/

66 "Outcome Assessment (health care)"/

67 "Process Assessment (health care)"/

68 Guideline Adherence/

69 Benchmarking/

70 "Standard of Care"/

71 Reference Standards/

72 (best practice or quality or standard* or benchmark* or adherence or requirement*).ti,ab.

73 or/60-72

74 Developing Countries.sh,kf.

75 (Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,kf,ti,ab,cp.

76 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines

or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp.

77 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

78 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

79 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

80 (low adj3 middle adj3 countr*).ti,ab.

81 (lmic or lmics or third world or lami countr*).ti,ab.

82 transitional countr*.ti,ab.

83 or/74-82

84 randomized controlled trial.pt.

85 controlled clinical trial.pt.

86 multicenter study.pt.

87 (randomis* or randomiz* or randomly or random allocat*).ti,ab.

88 groups.ab.

89 (trial or multicenter or multi center or multicentre or multi centre).ti.

90 (intervention* or controlled or control group or compare or compared or (before adj5 after) or (pre adj5 post) or pretest or pre test or posttest or post test or quasiexperiment* or quasi experiment* or evaluat* or effect or impact or time series or time point? or repeated measur*).ti,ab.

91 or/84-90

92 Animals/

93 Humans/

94 92 not (92 and 93)

95 comment.pt.

96 editorial.pt.

97 cochrane database of systematic reviews.jn.

98 comment on.cm.

99 review.pt.

100 review.ti.

101 or/94-100

102 91 not 101
103 1 and 83 and 102
104 7 and 32 and 83 and 102
105 7 and 46 and 83 and 102
106 7 and 59 and 83 and 102
107 7 and 73 and 83 and 102
108 or/103-107

4. **EMBASE** (Ovid)

#	**Searches**
1	"organization and management"/
2	government regulation/
3	social control/
4	professional competence/
5	clinical competence/
6	quality control/
7	health care quality/
8	total quality management/
9	or/2-8
10	1 and 9
11	(privat* adj6 (public* or stewardship* or governance or governing or coordinat* or co ordinat* or legislat* or regulat* or government* or law or laws or act or acts or policy or policies or politics or reform* or control* or supervis* or monitor*)).ti,ab.
12	(privat* adj6 (competence or practice pattern* or malpractice or mal practice or error*)).ti,ab.
13	(privat* adj6 (educat* or train or training or trained or colloquium? or conference? or course? or lecture? or meeting? or seminar? or support* or symposi* or workshop?)).ti,ab.
14	(privat* adj6 (best practice or quality or standard* or benchmark* or adherence or requirement*)).ti,ab.
15	or/11-14
16	10 or 15
17	Developing Country.sh.
18	(Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,ti,ab,cp.
19	(Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or

Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,cp.

20 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

21 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

22 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

23 (low adj3 middle adj3 countr*).ti,ab.

24 (lmic or lmics or third world or lami countr*).ti,ab.

25 transitional countr*.ti,ab.

26 or/17-25

27 Randomized Controlled Trial/

28 Controlled Clinical Trial/

29 Quasi Experimental Study/

30 Pretest Posttest Control Group Design/

31 Time Series Analysis/

32 Experimental Design/

33 Multicenter Study/

34 (randomis* or randomiz* or randomly or random allocat*).ti,ab.

35 groups.ab.

36 (trial or multicentre or multicenter or multi centre or multi center).ti.

37 (intervention* or controlled or control group or compare or compared or (before adj5 after) or (pre adj5 post) or pretest or pre test or posttest or post test or quasiexperiment* or quasi experiment* or evaluat* or effect or impact or time series or time point? or repeated measur*).ti,ab.

38 or/27-37

39 review.ti.

40 "cochrane database of systematic reviews".jn.

41 Nonhuman/

42 or/39-41

43 38 not 42

44 16 and 26 and 43

45 15 and 26 and 43

46 limit 45 to embase

5. **ISI Web of Knowledge** (Topic search)

Searches

TS=privat*

AND

TS=(stewardship* or governance or governing or policy or policies or politics or coordinat* or legislat* or regulat* or supervis* or monitor*)

AND

TS=(health* or medical* or pharmac* or drug or drugs or doctor* or physiscan* or nurse or nurses or hospital*)

AND

TS=(developing or less developed or lesser developed or underdeveloped or under developed or middle income or low income or lower income or transitional) AND TS=(countr* or nation$ or population$ or world) OR TS=(lmic or lmics)

AND

TS=(randomis* or randomiz* or impact or effect or evaluat* or control* or intervention* or "time series" or "time point" or "time points" or "repeated measure" or "repeated measures" or quasiexperiment* or "quasi experiment")

OR

TS=privat*

AND

TS=public*

AND

TS=(partnership$ or engagement$ or collaborat*)

AND

TS=(health* or medical* or pharmac* or drug or drugs or doctor* or physiscan* or nurse or nurses or hospital*)

AND

TS=(developing or less developed or lesser developed or underdeveloped or under developed or middle income or low income or lower income or transitional) AND TS=(countr* or nation$ or population$ or world) OR TS=(lmic or lmics)

AND

TS=(randomis* or randomiz* or impact or effect or evaluat* or control* or intervention* or "time series" or "time point" or "time points" or "repeated measure" or "repeated measures" or quasiexperiment* or "quasi experiment")

6. **WHOLIS (WHO)**

Searched in field: *Words or phrase*

privat$ **AND** public **AND** stewardship$ or govern$ or policy or policies or politics or coordinat$ or co ordinat$ or legislat$ or regulat$ or supervis$ or monitor$ or partner$ or engagement$ or collaborat$ **AND** random$ or impact$ or effect$ or evaluat$ or control$ or intervention or time series or time point$ or repeated measure$ or quasiexperiment or quasi experiment

C.6.2. GRADE summary of findings table

Training compared to no training for improving quality of care

Patient or population: private for profit providers
Settings: low and middle income countries
Intervention: Training
Comparison: No training

Outcomes	Illustrative comparative risks* (95% CI) Assumed risk / No training	Corresponding risk / Training	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
Quality of care(cluster RCT) Follow-up: 1-12 months	**Low**		**RR 3.12** (1.46 to 6.66)	1154 (3 studies)	⊕⊕⊕⊖ **moderate**[1]	
	60 per 1000	**187 per 1000** (88 to 400)				
	High					
	500 per 1000	**1000 per 1000** (730 to 1000)				
Quality fo care (RCT) Follow-up 1-12 months	**Study population**		**RR 0.99** (0.7 to 1.39)	2956 (6 studies)	⊕⊕⊕⊖ **moderate**[1,2]	
	484 per 1000	**480 per 1000** (339 to 673)				
	Low					
	270 per 1000	**267 per 1000** (189 to 375)				
	High					
	910 per 1000	**901 per 1000** (637 to 1000)				
Quality of care(CBA) Follow-up. 3 months	**Study population**		**RR 1.37** (0.81 to 2.33)	199 (2 studies)	⊕⊕⊖⊖ **low**[2]	
	22 per 100	**30 per 100** (18 to 51)				
	Low					
	7 per 100	**10 per 100** (6 to 16)				
	High					
	29 per 100	**40 per 100** (23 to 68)				
Quality of care(Quasi-RCT) Follow-up: 1 months	**Study population**		**RR 0.89** (0.79 to 1.06)	171 (1 study)	⊕⊕⊖⊖ **low**[2]	
	79 per 100	**71 per 100** (63 to 84)				
	Moderate					
	79 per 100	**70 per 100** (62 to 84)				
Quality of care (cluster RCT) Scale from. 0 to 0.16.	The mean quality of care(cluster RCT) in the control groups was **15**	The mean quality of care(cluster RCT) in the intervention groups was **0.16 standard deviations higher** (0.12 to 0.21 higher)		4445 (1 study)	⊕⊕⊕⊖ **moderate**[1]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI)

CI: Confidence interval; **RR**: Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] No description of the randomization
[2] The confidence interval is wide

Regulation compared to no regulation for improving quality of care

Patient or population: Private for profit providers
Settings: Vietnam, Lao People Democratic Republic and Thailand.
Intervention: Regulation
Comparison: No regulation

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk No regulation	Corresponding risk Regulation				
Quality of care (RCT)	**Study population**		RR 1.05 (0.81 to 1.37)	306 (2 studies)	⊕⊕⊖⊖ **low**[1,2]	
	92 per 100	97 per 100 (75 to 100)				
	Low					
	59 per 100	62 per 100 (48 to 81)				
	High					
	98 per 100	100 per 100 (79 to 100)				
Quality of care (cluster RCT) Scale from. 0 to 9. Follow-up: 3 months	The mean quality of care (cluster RCT) in the control groups was 9	The mean quality of care (cluster RCT) in the intervention groups was 0.07 standard deviations lower (0.13 to 0.01 lower)		4445 (1 study)	⊕⊕⊖⊖ **low**[1,2]	
Quality of care (RCT) Scale from. 0 to 16.	The mean quality of care (RCT) in the control groups was 16.44	The mean quality of care (RCT) in the intervention groups was 0.07 standard deviations higher (0.34 lower to 0.48 higher)		92 (1 study)	⊕⊕⊖⊖ **low**[1,2]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] No description of the randomization
[2] regulation measured indirectly for example checking the pharmacy drugs stock

C6.3. INSTRUCTION TO THE AUTHORS FOR LANCET JOURNAL